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A review of the South African horsefly fauna (Diptera: Tabanidae)

by

Pamela J. Usher

(Natal Museum, Pietermaritzburg)

SYNOPSIS

This paper reviews the Tabanidae known to occur in Africa south of Moçambique, Rhodesia and Angola. All the species are listed, the localities in which they have been found are grouped according to a system of climatic regions, and the distribution data are summarized in table form. There is a commentary on the nature and composition of the tabanid fauna, and data are presented for each climatic region detailing the number of species present, degree of endemism and extent to which the different tribes are represented. The geographical source of Wahlberg's material and the course of his travels are discussed, and it is shown that he did not collect in the south-eastern part of the Cape Province once called 'Kaffraria'. Conclusions are drawn regarding species density, areas of endemism, geographical features associated with endemic taxa, discontinuities in the tabanid fauna, and the thoroughness of collecting.

The following new synonymies are established: *Philoliche* (*Buplex*) *leucomelas* (Wied.) 1828 = *Buplex albicinctus* Austen 1937; *Philoliche* (*Ommatiosteres*) *caffra* (Macq.) 1847 = *Pangonia ramulifera* Loew 1863; *Braunsiomyia cinerea* (Surcouf) 1921 = *B. tigrina* Dias & Sousa Júnior 1957; *Haematopota albihirta* Karsch 1877 = *H. diasi* Dias 1956, and *H. tropai* Dias 1956.

INTRODUCTION

This paper is intended to be the counterpart of Goodier's (1966, 1967) study on the Rhodesian tabanid fauna and T. S. Dias' (1966) work on the horseflies of Moçambique. It is compiled only from records in Oldroyd's (1952–7) monograph, specimens in the Natal Museum (NM), and such data as I have acquired from private collectors, museum staff, collections sent for identification, field work and visits to other institutions. Almost all the specimens mentioned below Mr H. Oldroyd has identified or I have seen myself.

'South Africa' for the purpose of this paper is not only the Republic of South Africa but also Lesotho, Swaziland, Botswana and South West Africa, and excludes Rhodesia, Angola and Moçambique. I have used the climatological regions within this territory that were defined by Schulze (1965), to give a more detailed analysis than Oldroyd was able to do when dealing with the whole Ethiopian Region. The area covered is enormous and diverse, and this study must be considered as preliminary. Tabanid records often are sparse, and, with collecting dates, often reflect the flight paths of entomologists rather than the distribution of the flies. Biological data are rare indeed, for many species there is none at all, and for some species no precise locality or date. A high proportion of unique records is from montane areas and rather fewer are from remote areas, suggesting that accessibility gives a pronounced bias to the overall results.

There has been little systematic collecting over a long period as was done by Goodier in Rhodesia. However Mr J. S. Taylor collected in the George district for the Natal Museum, and the Oatley and Stuckenberg families have been keeping records consistently for about three years in the hills on the west side of Pietermaritzburg. A Harris Fly Trap in a paddock in Blackridge, Pietermaritzburg, yielded remarkable results, trapping eight species, while another three were taken while biting bait horses. Several of these tabanids had not been taken before in the area, and the total of eleven species represents nearly a quarter of the species known from region D (see fig. 1).

In the locality lists below all available months of collection are given in Roman numerals. In cases where Oldroyd has given months not included in my lists, these are added.

A few difficulties with the boundaries of the climatic zones used must be mentioned (fig. 1). I have distinguished between Pietermaritzburg city with the eastern suburb of Scottsville and the three western areas of Blackridge, Winterskloof and Town Bush, because the boundary line on the map appended to the publication by Schulze (1965) cuts through Pietermaritzburg so allowing this well-collected area to be conveniently divided into the best suited zones. To the east is drier, rolling grassland and thornveld, to the west cooler, moister, wooded hills showing the characteristics of D. Grahamstown district shows more affinity to SE than A where it is included and the real zoogeographic boundary here is at Algoa Bay rather than the more northern Fish River as marked (Stuckenberg, 1962). L is a very complex area with topographical inclusions of highveld mountains complete with their specialized flora and fauna. At the southern limit of D the boundary falls close to the Hogsback Range which I have included in this zone because of its Drakensberg affinities;

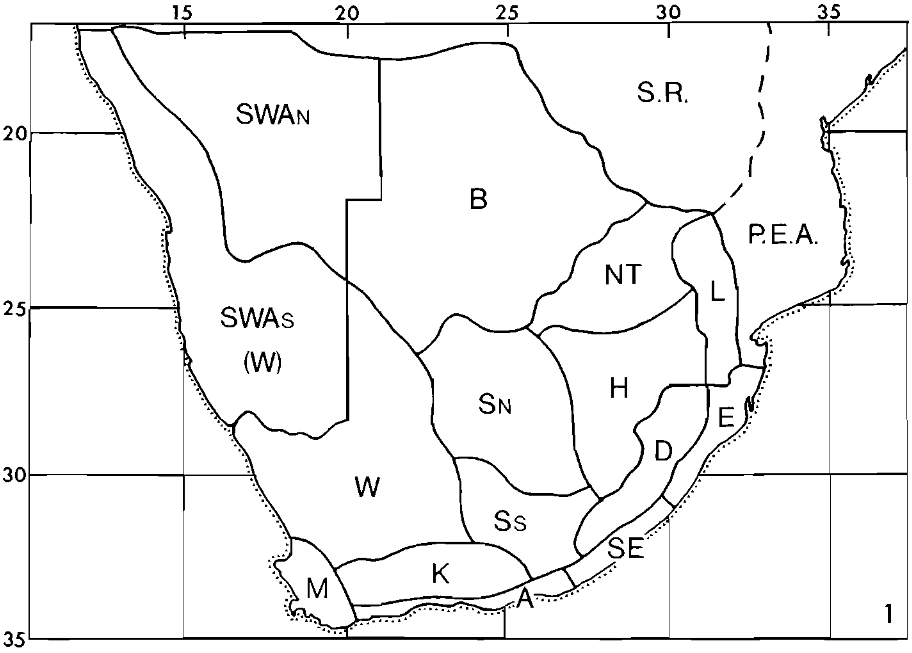

Fig. 1. Map showing the climatic regions used in this study (after Schulze, 1965).

unfortunately the boundary cannot be stretched to include the Katberg Range which falls in SS despite being more or less continuous with the Hogsback and separated from it by a less formidable gap than the Great Kei River valley which is a faunistic barrier between the Hogsback and the Drakensberg Escarpment (Stuckenberg, 1962). There is no sharp definition between M, K and W, the flora and fauna of M often going through mountain passes in these areas to fade out in the dry rain-shadow areas beyond. Several tabanid species are found consequently not only in M but in near-by areas of W and K. To sum up, the boundaries of the climatic regions are man-made and finite, but there is nothing faunistically or floristically finite about them and the regions merge to varying degrees. Nevertheless, climate is the outcome of the effects of meteorological phenomena, topography and latitude, which collectively determine the nature of the flora and fauna, and I think the use of such zones is justified by the results given below.

Bibliographical details and synonymies for most of the taxa are given by Oldroyd (1952, 1954, 1957) and for some by T. S. Dias (1966), so it is unnecessary to publish them again here.

THE DISTRIBUTION OF SPECIES RECORDED FROM 'KAFFRARIA'

While studying South African Tabanidae, I became aware that a number of species listed by Oldroyd as from 'Kaffraria' (Caffrerei, *auct.*) have never been recorded again from the south-eastern part of the Cape Province (SE, fig. 1) traditionally known by that name to early travellers. The species in question were collected by the Swedish traveller J. A. Wahlberg and recorded or described by Loew (1858, 1860). My husband used the summary of Wahlberg's diaries given by Brinck (1955: 25–34) to prepare the map shown in fig. 2 which covers the known extent of Wahlberg's travels in southern Africa up to the time he met an unfortunate fate when he was himself collected by a wounded elephant in northern Botswana. Much of his time was spent collecting in Natal, particularly in the vicinity of Port Natal (now Durban), and during two journeys he made through Natal and the Orange Free State to the Transvaal and the south-eastern border of Botswana. It was from these areas that his material of many of the species listed below must have originated. Wahlberg spent only a short while collecting in the Cape Province—a few days at Algoa Bay in May 1839 and in the Cape Peninsula in February–May 1839—poor collecting times at both localities. Some of the material taken on his later travels in South West Africa and Botswana is correctly labelled, but some is labelled as from Kaffraria. This problem is not limited to Tabanidae; Mr B. H. Lamoral of the Natal Museum has found that certain of Wahlberg's scorpions, labelled as from Kaffraria, belong to species occurring only in South West Africa.

The affected horsefly species are: *Pangonia* (now *Philoliche*) *sauvis* Loew; *P. brunnipennis* [= *Philoliche subfascia* (Walker)]; *Silvius* (now *Hinea*) *pertusus* Wied., *S. glandicolor* [= *Hinea fallax* (Macq.)], *S.* (now *Mesomyia*) *cuneatus*, *S.* (now *Mesomyia*) *confluens*, *S. decipiens* [= *Mesomyia decora* (Macq.)]; *Chrysops ciliaris*, *C. stigmaticalis* [= *obliquefasciata* Macq.]; *Tabanus* (now *Atylotus*) *fulvianus*, *T. sericiventris*, *T. bovinus* [= *ustus* Walk.], *T. trisignatus* [= *fraternus* Macq.], *T. variabilis*, *T. gratus*, *T. insignis*, *T.* (now *Amanella*) *sulcipalpus*; *Haematopota scutellaris*, *H. bistrigata*, *H. circumscripta*, *H. dorsalis* [= *decora* Walk.].

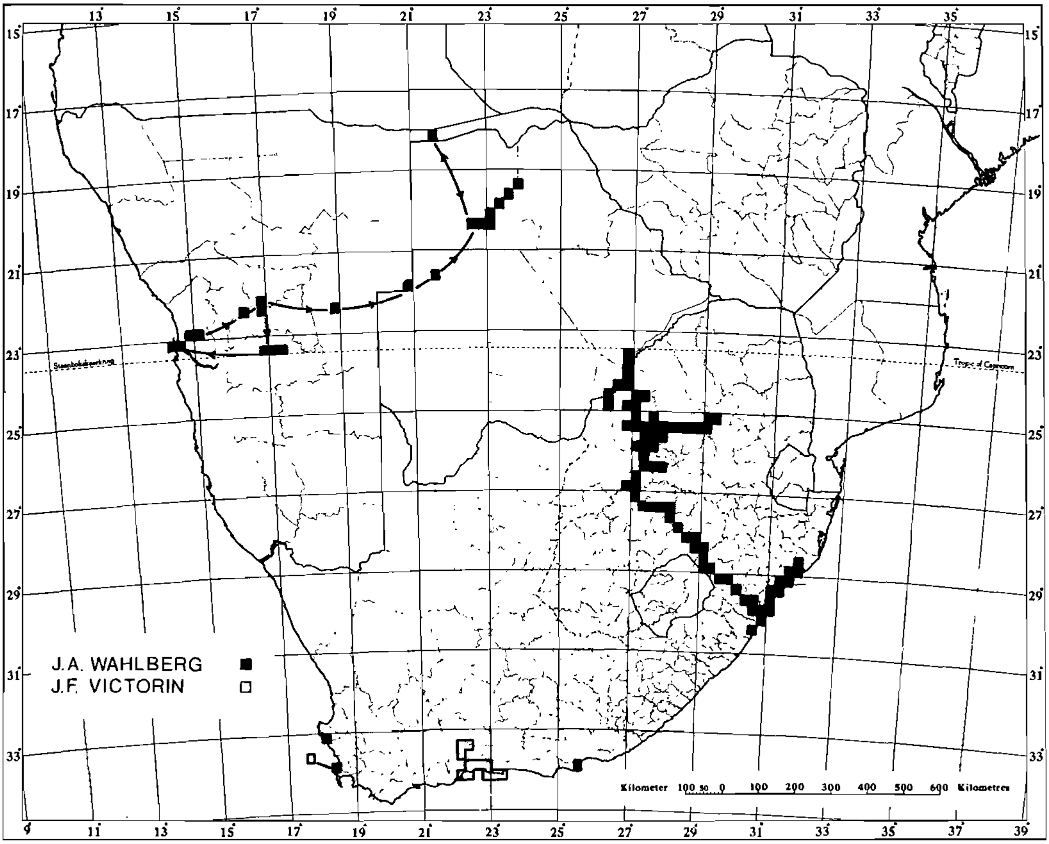

Fig. 2. Map showing the parts of Southern Africa in which insect collections could have been made by the two Swedish naturalists J. A. Wahlberg and J. F. Victorin. This is based on the account of their travels given by Brinck (1955). Wahlberg's exact routes are not always known, so all the plotting has been done by filling in ¼° squares of latitude and longitude through which it is reasonably certain the routes of these travellers lay. Data for Wahlberg's travels in South West Africa are incomplete.

CHARACTERISTICS OF THE CLIMATIC REGIONS

M. Mediterranean climate with orographic and cyclonic winter rainfall from May to September and some snow on the mountains. Summers warm to hot, dry except for rare thunderstorms. Rainfall varying from 3 000 mm on some mountains, to 400–500 mm on the Cape Flats and 250 mm in rain-shadow areas. Frost is rare on the coastal plains but usual in the mountains in winter. Topographically this area is greatly broken up, with mountains rising steeply from low plains. Macchia is the predominant vegetation, with some xeric karoo flora in rain-shadow areas.

A. Rainfall throughout the year, slightly more in autumn and spring, mainly orographic and cyclonic with occasional thunderstorms varying in quantity with the topography which is dominated by longitudinal, roughly east-west mountain ranges close to the sea, cut by river valleys and passes. Thus, rainfall at George and Knysna may exceed 1 100 mm p.a. but on the plains south of Riversdale may be barely 400 mm. The Langeberg and Outeniqua Ranges may have winter snow, but frost is almost unknown. Summers are not hot. The vegetation is varied, with much macchia and forest on seaward slopes.

K. Little and Great Karoos, semi-arid to arid, low rainfall distributed throughout the year with slight maxima in March and November. A mountainous area, with long ranges running east-west and rising out of dry plains, often a strikingly stark, usually stony landscape. Being in the rain-shadow of ranges in A and M, average rainfall is less than 250 mm p.a., only on certain mountain ranges (e.g. the Zwartberg) exceeding 750 mm. Snow in winter on the higher mountains. A feature of the region is great diurnal and seasonal temperature fluctuations. The flora is mixed, a sparse grass cover on the Great Karoo, the Little Karoo with sparse dwarf trees and shrubs and many succulents, the montane areas with sparse grass and macchia.

W and SWAs. Desert and poor steppe, occupying about half of the Cape Province, southern South West Africa and the Namib Desert in the north. Rainfall unreliable, inland about 450 mm p.a., mainly convectional showers in summer and autumn, decreasing to 50 mm in winter mainly towards the coast. Single, very rare heavy falls and snowfalls occur. Fog is frequent along the coast, its condensation important to the vegetation. Great diurnal and seasonal temperature fluctuations are a feature. W is mountainous in the south and south-west, with extensive arid plains in the centre and north. The dominant feature of SWAs is the north-south aligned central mountainous area; to the west the land dips down to the coastal Namib, and to the east it emerges with the flat Kalahari plain. The sparse vegetation includes many succulents and areas of karoo scrub and desert; there are isolated patches of macchia on the mountains.

SS and SN. Southern and northern steppes respectively, semi-arid with about 250 mm of rain in the west and 500 mm in the east, largely from thunderstorms, from October to March with a peak in February or March. Snowfalls may occur in winter on the southern mountains but rarely in SN. Temperatures fluctuate greatly both seasonally and diurnally. Vegetation is mainly of the karoo type, predominantly small shrubs, some succulents and sparse grass, but there are large areas of scrubby mixed grassland in the south and bushveld in the north. Topographically SS includes broken mountainous country in the south and east, elsewhere plateau country with many hills. SN is an extension of the high central plateau, not mountainous but with hills, decreasing in altitude westward.

SE. South-east coastal region, akin to A but with summer rainfall having a maximum in March, varying from about 500 mm p.a. in the Fish River valley to about 1 250 mm at Port St Johns, rainfall mainly convectional but sometimes orographic and cyclonic. Topographically the area is made up of the south-eastern plateau slopes deeply incised by large river valleys; it is an area of almost continuous mountains, valleys and hills, without a true coastal plain. Vegetation is mainly bushveld (often dense when not overstocked), grassveld on the mountain slopes, and isolated forest patches of which that at Port St Johns is an important example. The valleys are relatively dry, with xeric scrub.

E. East coastal region with warm to hot, humid, subtropical climate. One of the best-watered regions of South Africa, the rainfall varying from 760 mm p.a. in the northern interior to 1 250 mm on parts of the coast and some inland mountains. Most rainfall is convectional, occasionally very heavy and prolonged but orographic and cyclonic rain also occurs. In the south the topography is much as in SE, hilly to mountainous with deep river valleys, the relief along the coast becoming less extensive northwards until a coastal plain appears in the vicinity of Durban. This plain widens northwards into Zululand (north of the Tugela River). Inland the country is hilly, but mountainous in the middle adjacent to the Tugela River valley. The vegetation is very varied and rich; there are many grass-covered hills, forest patches on seaward-facing hillslopes, *Acacia* thornveld in the valleys, and bush and forest along the coastal plain. A tropical element in the vegetation becomes more predominant towards and throughout Zululand.

D. Drakensberg region, similar to SE and E but with greater seasonal and diurnal temperature variation, being higher and further inland. Rainfall varies from 680 mm in the Tugela Basin to over 1 900 mm in places against the Drakensberg. Rainfall is largely convectional, with many thunderstorms; mists and drizzles often occur along a series of step-like escarpments parallel to the coast. Snow is more frequent on high areas than elsewhere in South Africa. The southern half of D is dominated by the Drakensberg escarpment and the foothills cut by deep river valleys; the northern part has the Tugela Basin drainage complex, bordered north and west by escarpment slopes of the highveld. The vegetation is largely mixed grassveld, *Acacia* thornveld in the valleys, and forest patches on sea-facing slopes and in sheltered foothill valleys. Floristically the foothills and slopes of the Drakensberg are rich areas, with alpine grassland being replaced on the escarpment summit by ericoid scrub.

L. The Transvaal lowveld. Annual rainfall varies from about 500 mm in the north to about 700 mm in the south, increasing rapidly with altitude against the escarpment bordering the highveld, to 2 000 mm in places. Rain falls from November to March mainly, with a January maximum, mainly during thunderstorms over low-lying areas, with orographic rain against the escarpment. Climate warm to hot, summer humidity high. In the northern half of this region the land is flat, merging with the Moçambique plain and Limpopo River valley. The southern half contains the complex middleveld mountains to the west, with deep-cut valleys and broken topography, the elongate, rather low Lebombo Range to the east, and between them true lowveld plains. The vegetation is correspondingly complex; there is bush and grass savannah, and dense woodland, on the lowveld plains, and grassveld with macchia patches on the mountain slopes.

H. The highveld, with an average annual rainfall of about 900 mm in the east and 650 mm in the west, almost entirely convectional, falling from October to March with a peak in January. Frost can be expected from May to September and snow occurs in winter in many areas. This region contains the montane block of Lesotho in the south, with the highest mountains in South Africa, bordered by the Drakensberg Escarpment in the east. There the vegetation is scrubby mixed grassveld, sparse ericoid plants on the escarpment top and mountain peaks, and some montane meadows at springs and sponge areas. Zoogeographically much of Lesotho is distinct from the rest of the region; above about 2 100 m the incidence of endemism is high, especially in invertebrates, affinities being with the fauna of the Cape mountain ranges. To the north and west of Lesotho are highlands of the Orange Free State and the Transvaal highveld, dipping gradually westward to the Vaal drainage, otherwise topographically undifferentiated plateau country. It is mainly an area of mixed grassveld.

NT. The northern Transvaal, semi-arid and hot in the Limpopo and Olifants River basins, but cooler and damper in the Zoutpansberg Range and Waterberg Plateau. Rainfall, mostly as thunderstorms, varies from about 380 mm in the north to just over 700 mm in parts of the Waterberg, and falls from November to March with a January maximum. The rainfall is somewhat unreliable and droughts are frequent. Summers are often oppressively hot. This is an area of rolling plains, steadily descending to the Limpopo drainage system with minor mountain ranges and the Olifants basin in the south-east. Bushveld covers much of the area, with some grassveld, and forest patches on the Zoutpansberg Range.

B and SWAn. These adjoin NT, SN and W and are compounded of their climates, but become more humid northwards. Average annual rainfall varies from 250 mm in the south-west to 600 mm in the extreme north. The rainy season is from November to March; in Botswana the maximum occurs in January but around Windhoek the peak is in February or March. Rainfall is almost exclusively convectional with the occasional heavy fall in the north. Summers are hottest in the south on account of the cloudier weather in the north, but winters are warmer in the north. SWAn includes the highlands around Windhoek, but also much flat country. On the southern plateau the vegetation is of a karoo type, passing northward into grass steppe. In Damaraland and the eastern sandveld of the Kalahari, thorn savannah with grass is dominant, merging into dry forest with Mopane (*Colophospermum mopane*) woodland north of Etosha Pan. Topographically Botswana is an arid plain with minor ranges of hills. To the north is the Okovango swamp system. Much of the vegetation is woodland savannah, predominantly *Acacia* species. In the north-east Mopane and other woodlands occur. There is also much grassland, but true forest is rare.

CHECKLIST OF SOUTH AFRICAN TABANIDAE

Subfamily Pangonniiae

Tribe Pangoniini

Genus *Stuckenbergina* Oldroyd 1962

Type species *S. africana* Oldroyd, by original designation.

S. africana Oldroyd 1962

M: Bainskloof, Wellington Dist 600 m type locality, 1 ♀ 1 ♂.

These specimens were found resting in shady crevices in large sandstone boulders high on heath-covered slopes of the Bainskloof Mts. When disturbed they flew to another shady crevice. They made no attempt to bite.

S. callani Oldroyd 1962

A: Groot Rivier, 19 km E of Plettenberg Bay X. Type locality.

Tribe Philolichini

Genus *Philoliche* Wiedemann 1828

Type species *Tabanus rostratus* Linnaeus, by designation of Coquillet 1910.

In the Ethiopian Region there are nine subgenera in this genus, eight of which are present in South Africa.

1. *Buplex* Austen
2. *Dorcaloemus* Austen
3. *Maverica* Oldroyd
4. *Ommatiosteres* Enderlein
5. *Phara* Walker
6. *Philoliche* Wiedemann
7. *Returneria* Oldroyd
8. *Stenophara* Enderlein

Subgenus *Buplex* Austen 1920

Type species *Pangonia sauvis* Loew, by original designation.

P. (*B.*) *basalis* Oldroyd 1828 (new name for *Pangonia thoracica* Wiedemann).

Holotype labelled only 'Pr. b. sp. Lichtenstein' i.e. **M**: Cape Peninsula. **W**: Nieuwoudtville, Calvinia Dist. XI.

P. (*B.*) *brachyrhyncha* (Bigot) 1892

'Cape Province'. No precise locality or date.

P. (*B.*) *brincki* Oldroyd 1957

M: Kleinmond, Caledon Dist., ♀ holotype only, XII.

P. (*B.*) *dissimilis* (Ricardo) 1914

W: type locality, Vanwyksvlei (about 60 km NNW of Carnarvon).

P. (*B.*) *fuscinervis* (Austen) 1920

SE: Bizana, type locality, no date, 2 ♀♀.

P. (*B.*) *leucomelas* (Wiedemann) 1828

Buplex albicinctus Austen 1937, *Proc. Zool. Soc. Lond.* **107**: 277 **syn. nov.**
No precise date or locality on the holotype of *leucomelas*. Type locality of *albincinctus*—**M**: Hottentots-Holland Mts, 64 km from Cape Town. Other localities, **M**: Great Winterhoek Mts, Tulbagh IX; Stellenbosch XI; Franschhoek Pass X; Villiersdorp X. **A**: Robinson's Pass, near Mossel Bay X.

Intermediates bridging the gap between the species and making synonymy necessary are in the NM.

P. (*B.*) *praeterita* Oldroyd 1957

M: Hottentots-Holland Mts, 1 220 m. No date.

P. (*B.*) *suavis* (Loew) 1858

The type locality is said to be 'Kaffraria' but the holotype apparently 'bears no indication of its origins' (Oldroyd, 1957: 392). **H**: Potchefstroom I. **L**: Crocodile R. Bridge, Kruger National Park II; Tshokwane, Kruger National Park XI. **K**: Zoar, near Ladismith. **NT**: Pretoria; Hammanskraal, N of Pretoria II. **SE**: Arnoldton.

P. (*B.*) *subfascia* (Walker) 1854

The sexual dimorphism of this species has resulted in several synonyms. The type locality of *subfascia*, the male form, is Port Natal (Durban), and that of *brunnipennis* (Loew), the female form, is 'Kaffraria'. **E**: Scottburgh XI; Stellabush, Durban XI, XII; Umbilo XII; Malvern, Durban Dist XII; Gwalaweni Forest, Ingwavuma Dist XI; Eshowe; Ingwavuma Dist XII; Umfolosi Reserve XII; Ndumu XI; Hluhluwe (on horse) I; Pietermaritzburg; Umhloti; Ulundi XII; Howick. **L**: Barberton.

Subgenus *Dorcaloemus* Austen 1910

Type species *Pangonia compacta* Austen, by original designation.

P. (*D.*) *silverlocki* Austen

Zambia, Malawi, Rhodesia, P.E.A. XII–V. **E**: Mkuze I. **NT**: Martins Drift III.

Subgenus *Maverica* Oldroyd

Type species *Pangonia spiloptera* Wiedemann, by original designation.

P. (*M.*) *ingrata* Oldroyd 1957

K: Rust en Vrede, Oudtshoorn Dist, type locality; Klaarstroom, Prince Albert Dist; Zebra, Oudtshoorn Dist, Little Karoo. **M**: Leipoldtville, Elands Bay, Atlantic Coast. Oldroyd's dates, IX–X.

P. (*M.*) *spiloptera* (Wiedemann) 1821

M: 'Oceania, Cap des Aguilles' (Cape Agulhas) type locality; Worcester; Stellenbosch; Malmesbury; Clanwilliam IX; Worcester IX. **K**: Seven Weeks Poort IX; Ladismith IX; Laingsburg. **W**: Vanrhynsdorp VIII; Namaqualand, Kamieskroon & Klipfontein.

Subgenus *Ommatiosteres* Enderlein 1922

Type species *Pangonia angulata* Fabricius, by original designation.

P. (*O.*) *angulata* (Fabricius) 1805

Colour forms: *sexfaciata* Walker, *alboatra* Walker, *angulata* Fabricius, *pulchra* Thunberg.
Distributed from **M**: Cape Town, to **W**: Namaqualand, and as far east as **A**: Port Elizabeth. *sexfaciata*—**A**: Wit Rivier Valley, Patensie Dist XII. **K**: Klaarstroom, Prince Albert X. **W**: Victoria West XII. *alboatra*—**M**: Du Toit's Kloof 600–106 m IX; Stellenbosch X; Fish Hoek X; Cape Town IX. **K**: Seven Weeks Poort XI *angulata*—**M**: Montagu X; Palmiet R, Caledon X; Stellenbosch X; Kirstenbosch XI; Ysterfontein IX. **A**: Tradouw Pass XI; Schoeman's Poort X. **K**: Seven Weeks Poort X. *pulchra*—**M**: Witsands, Cape Peninsula X; near Cape Town X, XI, XII; Camps Bay XI; Muizenberg X; Palmiet R Mouth, near Caledon X; Table Mountain, Cape Town XII; Stellenbosch XI. **W**: between Kamieskroon and Springbok X.

P. (*O.*) *atricornis* (Weidemann) 1821

Numerous localities from **W**: Namaqualand, to **SE**: Pondoland and **D**: Balgowan. **A**: Bushmans R Bridge, near Grahamstown XII. **SE**: Port St Johns X; Stellenbosch IX, X. **W**: Koup siding, Laingsburg X; near Willowmore. **D**: Pateni Tea Estates, Richmond XII.
At Pateni it was present in numbers on a grassy hill slope, attacking human beings persistently. Near Grahamstown it flew to a car from weedy old lands.

P. (*O.*) *caffra* (Macquart) 1847

P. (*O.*) *ramulifera* Loew 1863, as *Pangonia ramulifera* Loew, 1863, *Wien. ent. Monatsch.* **7**: 9. **syn. nov.**
Type locality of *caffra*, 'Cape'; type locality of *ramulifera*, Bloemfontein. **H**: Mamathes; Ladybrand I; Bokong I, XII; Bokong—Malibamatso R junction I; Mahlatsa I: Malibamatso I. **SN**: Thaba Nchu XII. **M**: Clanwilliam X. **SWAs**: Haalenberg, Namib XII. **SS**: Herschel XII.
Intermediates are in the NM, and have been seen by Oldroyd.

P. (*O.*) *lateralis* (Fabricius) 1805

W: Western area from Namaqualand to **A**: Mossel Bay and **K**: Oudtshoorn IX–XII (Oldroyd 1957). **A**: Coldstream, Tsitsikama Area X; Zwartkop R, Port Elizabeth (coastal dunes) X; Knysna XII; Wilderness XII (on person). **M**: Arniston dunes; Ysterfontein; Cape Peninsula nr. Cape Town XII; Somerset Strand.

P. (*O.*) *marriotti* Usher 1967

D: Drakensberg, SE of Cathedral Peak VII, type locality.

P. (*O.*) *nitida* Usher 1968

A: Elandsrivier Area, S of Cockscomb Mt, Patensie Dist XII, type locality.

Subgenus *Phara* Walker 1850

Type species *Cadicera rubramarginata* Macquart, by monotypy.

P. (*Phara*) *andrenoides* Usher 1965.

D: Cathedral Peak Area, Natal Drakensberg, 2 000 m, II, type locality; Hogsback XII.

The holotype was caught at a place frequented by Eland (*Taurotragus oryx*). Despite its booming flight, the species is difficult to catch, being very fast. In flight it is an excellent bee-mimic.

P. (*Phara*) *bivirgulata* (Austen) 1937

E: Eshowe XI, XII; 'Marikburg' from Oldroyd, probably Maritzburg (Pietermaritzburg) XI. **D**: Karkloof XII, I; Balgowan; Boschoff's Rd (Boshoffweg) between Hilton and Winterskloof, Pietermaritzburg Dist.
Inside and on the margins of the Karkloof forest this is a numerous, aggressive and attentive species. The proboscis is short and in order to bite, it appears that this fly must either settle or hold with the legs while hovering.

P. (*Phara*) *chrysostigma* (Wiedemann) 1828 and f. *nigripes* Enderlein

Both labelled only 'The Cape', no date.

P. (*Phara*) *crassipalpis* Macquart 1837

A: Algoa Bay XI; Grahamstown II.

P. (*Phara*) *flavipes* (Macquart) 1838

Cape (Delalande), type locality **A**: Keurbooms R near Knysna I.

P. (*Phara*) *fuscanipennis* (Macquart) 1855

M: Ceres; Hugenot, Paarl Dist; Boschkloof, Worcester Dist; type locality Oceania, Cape des Aiguilles, (Cape Agulhas); Stellenbosch VII. Oldroyd's dates, I, II.

P. (*Phara*) *melanopyga* (Wiedemann) 1919

SS: Middelburg; Barkly East; Deelfontein, De Aar Dist XII. **H**: Afrikaskop, Bethlehem Dist XI, 2 100–2 400 m; Potchefstroom XI; Bushman's Pass, Maluti Mts; Mamathes, Lesotho XII. **NT**: Pretoria North X–XII; Pretoria IX; Hammanskraal, Pretoria Dist.

P. (*Phara*) *nobilis* (Wiedemann) 1838

'Kaffraria' type locality. **D**: Newcastle. **NT**: Rustenburg X. **SS**: Katberg I. **A**: Grahamstown XI.

P. (*Phara*) *oreophila* Usher 1967

D: Giant's Castle Game Reserve XII, type locality.

P. (*Phara*) *quinquemaculata* (Austen) 1908

SE: Pirie Bush near King William's Town, type locality; Port St Johns X; East London XII. **E**: Upper Ubombo; Gwalaweni Forest (biting man) XI; Eshowe XI, XII. **D**: Howick; Karkloof XI; Balgowan Tongaat; III. **L**: Malta Forest XII, I. **NT**: Woodbush, Tzaneen Dist XI, XII; Haenertsburg XI.

P. (*Phara*) *rubramarginata* (Macquart) 1855

A widespread species, from **W**: Namaqualand, Bushmanland, to **M**: Swellendam, through Natal, the Transvaal, Rhodesia, to Malawi X–XII. **K**: Seven Weeks Poort, Laingsburg Dist XI; Matjiesfontein XII. **W**: Steinkopf, Okiep Dist VIII. **A**: Tradouw Pass, Swellendam Dist. **M**: Stellenbosch X, XI. **E**: 'Krantskloof', i.e. Kloof Nature Reserve X, 1903. **D**: Estcourt XI. **NT**: Pretoria North IX, XI.

P. (*Phara*) *tertiomaculata* Oldroyd 1957

L: Barberton, ♀ holotype, no date.

P. (*Phara*) *tumidifacies* (Austen) 1937

K: Willowmore I, II, type locality.

P. (*Phara*) *turpis* Usher 1968.

A: Nature's Valley, Tsitsikama Forest XII, type locality.

Subgenus *Philoliche* Wiedemann *sensu stricto*

P. (*P.*) *aethiopica* (Thunberg) 1789

At the time Oldroyd wrote his monograph he was able to separate this species into two geographically separable subspecies, the typical form extending through the Cape Province to Namaqualand, and ssp. *rondanii* from Natal to Rhodesia. In the NM there are many specimens of this common species. While it is true that the most extreme, brightly coloured form with the long proboscis comes from the eastern Cape and the small, dark, short-snouted form from Natal and northwards, there are many more intermediates than distinct forms, as well as breaks in the geographical pattern (e.g. a *rondanii* from Grahamstown and a typical form from Pietermaritzburg). This is a highly complex problem badly in need of further study. For the present I have treated *aethiopica* as a single, very variable species. **K**: Rust-en-Vrede, Oudtshoorn Dist X; Touwerwaterkloof, Willowmore Dist X; Matjiesfontein IX. **W**: Krakadouw Pass, Wuppertal side, Clanwilliam Dist IX. **A**: Trappes Valley, Port Alfred Dist XI, I; Kenton-on-Sea XI, II; Grahamstown X, XI, XII, IV, V; Port Alfred II, VII, XI, XII; Kleinemond near Port Alfred I, VII, XI, XII; Kasouga XII; Resolution, Albany Dist III; Mossel Bay; Albany Dist V; Port Elizabeth X, XI, I, VII. **SS**: Steynsburg X. **SE**: Komgha XI; Port St Johns V, IX; East London VI; Hamburg; King William's Town Dist XII; Gzulu R near King William's Town XII. **D**: Waterkloof near Oliviershoek, Bergville Dist I; Hogsback XII; Karkloof XI, XII; Kettlefontein, Pietermaritzburg III, IV, IX, X; Blackridge, Pietermaritzburg III, IV, V, X; Hilton Road I; Merrivale Heights, Howick Dist III; Giant's Castle Game Reserve II; Zimbaba Forest, Kranskop II; Midmar Dam IV; Luneberg, Paulpietersburg Dist XII (biting cattle near forest edge 1 430 m). **E**: Montclair, Durban; Durban IV, X; Eshowe X, XII; Ngoye Forest II; Umfolosi; Gwalaweni Forest I; Ingwavuma XII; Mangusi R XI, XII; Tongaat; Scottsville, Pietermaritzburg X, XII, III, IV; Mkondeni, Pietermaritzburg IV; Mfongosi IV; Umgeni R IV; Scottburgh XI; Glendale Police Station (in a puddle of water) VIII; Umhlali X; Ndumu X; Tete Pan, Zululand X. **L**: Zoutpansberg Mountain near Louis Trichardt IV; Nelspruit XI; Scottburgh XI; Hectorspruit, Nelspruit Dist X; Headwaters of Gladdespruit R, Kaapsehoop XI (in grassland and gallery forest); Mt Emlembe, near Havelock Mine, Barberton Dist; Lomati R headwaters; Barberton; Havelock Rd XI; Mt Carmel, NW side XI (grassy hillside). **H**: Bushman's Pass, Maluti Mts I. **NT**: Rustenburg N.

This species is common and numerous in many parts of Natal, often to be found in grassland in the vicinity of forests, or in open parkland and grassland. The flight is very fast, and on the wing they make a penetrating booming. Cattle pestered by these flies are restless. Most of the flies hover around the legs and bellies of cows and horses (the shadowed areas), and it is a remarkable sight to see one attached to an animal by the proboscis only, hovering to keep pace as it moves. I have not been able yet to observe closely the feeding process, as few animals will tolerate the attentions of biting flies without disruptive protest. A horse was quite unperturbed by the attentions of a hovering *aethiopica*, although much irritated by the attentions of *Stomoxys* spp., so possibly the flies have to land in order to puncture the skin. It seems probable that feeding can continue on the wing once the fly is dislodged.

Mr Oatley noted that three of five females caught near Luneberg were dusted with pollen, and this is not uncommon. Cookson (1967) observed them basking in the sun in Rhodesia, but he did not see any coming to water although records of drowned males in puddles suggest they may do so. Mr Cookson has seen this species in the Vumba forest but writes (*in litt.*) that it avoids the thicker parts and shows a strong preference for glades and open spaces. Mr Oatley has seen *aethiopica* biting captive rhinos in Queen Elizabeth Park, Pietermaritzburg. Males come to light.

The full colour range is present at the Karkloof, Natal, from brilliant orange-brown and white, through pale lemon-yellow to the totally dark form. The proboscis is mainly of intermediate length but both long (but not extremely long) and short forms are found.

P. (*P.*) *elegans* (Bigot) 1892

Type locality 'Cape of Good Hope'. **SS**: Queenstown, Burghersdorp. **W**: Okiep IX. **A**: Loeri I; Dunbrody, near Addo; Resolution, Albany Dist I. **K**: Willowmore XII, I.

P. (*P.*) *formosa* (Austen) 1920

SS: Deelfontein SSE of De Aar, type locality. **L**: Zoutpansberg; Entabeni IX, XII. **E**: Hluhluwe. A very strange distribution.

P. (*P.*) *gulosa* (Wiedemann) 1828

M: Robertson, Paarl and Worcester Districts, X–XI; Pakhuis Pass, Clanwilliam Dist X; Paleisheuwel XI; Citrusdal Dist XI; Wit R Valley, Bainskloof XII; Het Kruis X; Olifants R between Clanwilliam and Citrusdal X–XI. **K**: Rust-en-Vrede, Oudtshoorn Dist X. **W**: Klawer X. **A**: Grahamstown XII. The last record is doubtful, although the specimen is clearly labelled, because all other records are from the winter-rainfall area. Klawer and Oudtshoorn fall only just outside the M boundary, and Grahamstown is very definitely of a different climate. Oldroyd states specifically that he has seen specimens from the Cape only. Also, only a single specimen from such a well-collected area as Grahamstown is strange.

P. (*P.*) *rostrata* Linnaeus 1764, and ssp. *bushmani* Oldroyd 1957

According to Oldroyd the typical form is found in the extreme south of the Cape Province—**K**: Oudtshoorn Dist; Ladismith. **M**: Paleisheuwel; Franschhoek; Palmiet R; Simonstown. The ssp. *bushmani* occurs further north towards the Orange River. **W**: Naib, the type locality, is between Springbok in Namaqualand and Pella in Great Bushmanland. I have not seen many specimens, and of those the most typical *bushmani* profile come from Cape Town and the best 'typical form' profile from Springbok, although both specimens have other intermediate characteristics. Nor are the remainder easily separated, so the records are listed together. **K**: Seven Weeks Poort XI; Willowmore XI. **M**: Table Mountain, Cape Town XII; De Wet, Worcester Dist X: Pakhuis Pass 950 m IX. **W**: Klawer IX; Klipvlei, Garies Dist, Namaqualand XI; Springbok, Namaqualand XI.

Several flew to humans and a car in alpine scrubland and macchia at the top of the Pakhuis Pass. The flight is very quick.

Subgenus *Stenophara* Enderlein 1922

Type species *Pangonia zonata* Walker, by original designation.

P. (*S.*) *ovambo* Oldroyd 1957

SWAn: Ondangua, Ovamboland, unique ♀ holotype II.

P. (*S.*) *zonata* Walker

From Somaliland to Rhodesia III–VI. **B**: Shakwe III.

Subgenus *Returneria* Oldroyd 1957

Type species *Pangonia alternans* Macquart.

P. (*R.*) *alternans* (Macquart) 1855

M: 'Cap des Aiguilles' (Cape Agulhas) type locality; Ceres; Swellendam. **A**: Mossel Bay; Jeffreys Bay; Humansdorp; Zwartkop, Port Elizabeth; Groot Rivier, Plettenberg Bay Dist I; Kasouga Dunes, Port Alfred Dist XII; Bathurst Dist. I; Port Alfred XII, I; Wilderness (attacking *H. sapiens*). **W**: Strandfontein Oldroyd's dates XII, II. Triangles, the type locality for Ricardo's synonym *albifacies*, is not on any map I have seen.

P. (*R.*) *adjuncta* (Walker) 1848

K: Matjiesfontein. **M**: Robertson XII. **SWAs**: Bushmanland; Jakkalswater 1728Dc; Een Riet X–XII.

Subfamily Scepsidinae

Tribe Scepsidini

Genus *Adersia* Austen 1912

Type species *Silvius oestroides* Karsch, by original designation.

A. ambigua Oldroyd 1957

A: Kasouga XII (type locality). This may well be the female of *callani*.

A. callani Oldroyd

A: Port Alfred ♂ holotype II. **SE**: Port St Johns ♂ I. **E**: Umhlanga Rocks X. There is a record from Beira, Moçambique, in December (Lindner, 1961). The specimen from Port St Johns was resting on sand dunes among *Ipomea* plants well above the tidemark, whereas Dr Irwin saw several at Umhlanga Rocks on damp sand just above the waves.

A. oestroides (Karsch) 1887

The type locality is 'Usambara', the only record of this species being taken away from the coast. Recorded from the coast of Tanzania and Zanzibar to the eastern Cape Province.

Observant collectors can often see the fly by the shadow cast as it rests on sand dunes, and must strike quickly before it takes wing. Sometimes a specimen may be visible flying over the sand. At all times they are liable to vanish, a sandy little object in a world of sand. Eggs are laid in seasand, and the larvae which live between the levels of neap and spring tides can withstand up to five hours submersion in water. Dampening of the sand seems essential for successful hatching of the eggs (Omer-Cooper, 1958).

A: Bathurst Dist., Kleinemond IX–III; Port Alfred XII; Kasouga Dunes XII; Riet R I. **SE**: Cove Rock, East London II; Port St Johns I. **E**: Umgeni R Mount, Durban IV.

Genus *Braunsiomyia* Bequaert 1921

Type species *Brodeni cinerea* Surcouf, by monotypy.

B. cinerea (Surcouf) 1921

B. tigrina S. Dias & Sousa Júnior 1957, *Bol. Soc. Est. Moc.* **106**: 148 (Moçambique) **syn. nov.**

The colour and banding of the abdomen are the only characters used by Dias & Júnior to separate the species. Natal specimens bridge the gap between the predominantly grey southern form and the banded Moçambique form. There are no morphological differences mentioned by Dias & Júnior, except the wing shape which is variable.

A: Port Elizabeth area; Port Alfred; Patterson III; Sand Flats V. **W**: Strandfontein, W of Vanrynsdorp X. **E**: Umhloti R mouth VI; Umhlanga Rocks VI; Sheffield Beach, Salt Rock VIII; Amanzimtoti VIII.

This appears to be the first record of the species for the west coast. On the Natal coast it appears to replace *Adersia* seasonally, occurring in winter only. Specimens were found mostly on dry sand beyond the tide reach. Patterson is a region of sand dunes, well inland from the sea (about 42 km), a dry area, without lagoon or river, where Dr M. Irwin found them resting as on a beach.

Subfamily Chrysopsinae

Tribe Chrysopsini

Genus *Chrysops* Meigen 1803

Type species *Tabanus caecutiens* Linnaeus, by monotypy.

Of the nine Ethiopian region species groups defined by Oldroyd, five are represented in South Africa. There are eight known South African species, about $\frac{1}{16}$ of the Ethiopian total.

ciliaris group

C. ciliaris Loew 1858

'Kaffraria' type locality. Rhodesia and Tanzania XI–X. No South African specimens in the Natal Museum.

C. fuscipennis Ricardo 1902

E: De Waal's Farm, Umfolosi III. **NT**: Moorddrift XII, Potgietersrus Dist; also from Rhodesia, Malawi, Uganda and S Sudan.

C. laticeps Austen 1910

Malawi; P.E.A. **E**: Kosi Bay (type locality); Ndumu; Ntsengwane area; NE Lake St Lucia I; Eshowe III; E shore central Lake St Lucia II.

After examining material taken by Mr K. Tinley in Zululand, Oldroyd (*in litt.*) is satisfied that this species is distinct from *fuscipennis* Ricardo. It occurs at marshy depressions in open grassland with few or no woodland trees. These marshes are seasonal or perennial and have very small sections of open water; the depressions are covered with dense stands of hygrophilous plants. Not caught elsewhere.

distinctipennis group

C. obliquefasciata Macquart 1838

Widespread in Ethiopian Region. **H**: Johannesburg; Potchefstroom: **L**: Skukuza, Kruger Park. **SN**: Fryberg. **SS**: Middelberg II. **E**: Sordwana; Umbilo II, III; Upper Tongaat XI; Umgeni Valley; Clairwood II. **NT**: near St George's Home, Pretoria XII. **D**: Royal Natal National Park I, IV; 'The Glen', Dundee area I; Kokstad I; Deeside, Cedara I; Castledene, Underberg Dist; Kettlefontein, Pietermaritzburg III; Grootgewacht Dam, Vryheid II; Blood River Vlei, Utrecht I, II; Rietvlei Dam, Vryheid II, III; Vryheid Dam I, II; Durnacol I, IX; Strathcona Farm, Vryheid Dist I. **A**: Port Alfred; Patterson III; Grahamstown II, III, IV; Albany Dist I; Bathurst II; Port Elizabeth X.

Sexual dimorphism is pronounced; the small plain black male is not holoptic, and the greenish-grey female is patterned. The species is often numerous around vleis and in marshy areas; Mr Van Rensburg reports 'All *Chrysops obliquimaculatus* were caught in marshy places on edges of dams by means of a net. They did not attempt to bite man.' It is common in watermeadows inhabited by cows at Royal Natal National Park.

laniger group

C. inflaticornis Austen 1910

SE: King William's Town Dist. Annshaw, no date.

C. laniger Loew 1860

From Cape to Kenya. **D**: Enon Farm, Richmond I; Kranskop, The Kop Forest I, IX, III. **A**: Groot Rivier, Plettenberg Bay Dist I. Caught on a bushy plant overhanging a stream on a hot, humid, sunny day. Inactive.

In Rhodesia Cookson (1967) watched both males and females flying over a small pool in montane forest and repeatedly dipping to brush the surface.

longicornis group

C. longicornis Macquart 1838

E: Durban IV, IX, X; Amanzimtoti I; Doonside I; Umkomaas XI; Margate I; Mangusi R XI; Eshowe XI, XII, II; Dukuduku Forest IV; Ngoye Forest II; Empangeni II; Gingindhlovo IV; Mtunzini II, III; Ntsengwane Area; NE of Lake St Lucia II. **SE**: Port St Johns XI; Umgazi R Mouth I.

Oldroyd says that this species occurs equally widely in forest and savanna, throughout the entire Ethiopian Region except for the arid belts. The specimens collected by Natal Museum staff have always been from woodland areas even if rather sparse; those from Port St Johns were inside the forest.

woodi group

C. calida Walker 1848

Holotype labelled 'South Africa', no further information. **A**: Howieson's Poort near Grahamstown X; Grahamstown I.

Tribe Rhinomyzini

Genus *Hinea* Adams 1905

Type species *Silvius pertusus* Loew, monotypic as *H. flavipes* Adams.

A genus of which the distribution is poorly known. As the larvae of some species have been found in rotholes, this may be a treetop-inhabiting genus.

H. fallax (Macquart) 1840

'Kaffraria' (old records). **E**: Pietermaritzburg; Malvern; Umgeni, Durban I; Port Natal, X; Umbilo XII; South Broom XII; Tongaat; Cape Vidal XI–XII; Ndumu XII; Widenham I; Krantz Kloof IV (Kloof Nature Reserve).

Dr Irwin caught both ♂♂ and ♀♀ at Cape Vidal, just inside the dune forest where the dune forest and xeric *Acacia* zones meet. The flies appeared reluctant to take wing, but when disturbed flew slowly a few metres about 1 m above ground before settling on the broad-leaved plant comprising the main cover of the forest floor. They landed on the upper leaf surface and promptly scuttled over the edge near the apex, then turned around and raised their heads apparently to keep an eye on him.

H. lugubris Austen 1937

Known from Rhodesia and Zambia. There is a record from **L**: Malta Forest II, and one from 'Sikororo' which I cannot locate but suspect to be in the Transvaal Lowveld.

H. pertusa (Loew) 1858

Widely distributed from 'Kaffraria' to the Congo XII–LL. **B**: Botswana. **E**: Ndumu XII at light. **SWAn**: Etosha.

Genus *Sphecodemyia* Austen 1937

Type species *S. lamborni* Austen, by original designation.

Peculiar wasp-like species, not frequently found in collections. The larvae of two species are known to be rothole-breeders; perhaps the genus comprises tree-top flies, which would explain their apparent rarity.

S. lamborni Austen 1937

The adults, which show striking sexual dimorphism, were bred from eggs and larvae found around rotholes high up in trees, (*Brachystegia* and *Sterculia* spp.), only rarely less than 1½ m from the ground. For many years they were known only from the original locality in Malawi, near Fort Johnston, until Mr Oatley found a male at light in the Ndumu Game Reserve (**E**), XII.

S. natalensis Oldroyd 1957

E: Greenwood Park X, unique ♀ holotype; Eshowe XII, in NM, caught by Mr and Mrs H. Townes.

Genus *Tabanocella* Bigot 1856

Type species: *Silvius denticornis* Wiedemann, by original designation.

More than half of the Ethiopian species occur in Madagascar; five species occur in South Africa one of which, *T. denticornis* (Wiedemann) is common and widespread in South Africa and Rhodesia.

T. bilineata Oldroyd 1957

D: Van Reenen Pass, Drakensberg; Impetyne Forest near Weza XII. Mr Oatley caught three specimens at the latter locality, of which he writes, 'although appearing superficially to be *T. denticornis*, [they] have wing patches paler in colour and in life the eyes were strikingly barred with emerald. They were caught biting man in short grassland outside forest at 0900 hours, weather cool and cloudy'. I have tentatively identified these as *bilineata*, because of the paler wings, and the presence of genuine *T. denticornis* with plain, dark eyes inside the forest mentioned by Mr Oatley.

T. denticornis (Wiedemann) 1828, and form *natalensis* Oldroyd, 1957

According to Oldroyd the typical form is distributed 'throughout Southern Africa from the Cape Province: Swellendam, northwards to Southern Rhodesia'. The melanic form *natalensis* appears in Natal and Pondoland predominantly, but so many intermediates exist that I have not attempted any separation.

E: Mtinzini II, III; Ntsengwane area NE of Lake St Lucia II; Dhlozi Peninsula, Lake St Lucia II; Ngome Forest II; Eshowe XI, XII, II; Ngotshe Gorge, Entumeni, Eshowe Dist II; Richard's Bay II, (attracted to vehicle at night); Simangwane XII; Mangusi R XI, XII (from isolated patch of coastal forest); Umhlali I; Umbilo XI, XII, II; Park Rynie XII; Ramsgate South I, II, XI, XII; Oribi Gorge XI; Gillitts XI, I; Blythedale Beach III; Tugela Mouth I, II, XI, XII; Nagel Dam IV; Pietermaritzburg I, II; Cowies Hill I, II.

D: Lundy's Hill (Deepdale); Umkomaas I, (in evergreen forest); Kranskop I; Karkloof Forest XI, I; Pateni Mt, Richmond XII; Blackridge and Winterskloof, Pietermaritzburg XI, XII, I, II, III; Town Bush, Pietermaritzburg I, II, IV, XI, XII; Enon Forest, Richmond I; Ingeli Forest, Kokstad; Impetyne Forest, Weza XII; Kilgobbin Forest, Dargle XII. **SE**: Port St Johns XII, I; Umgazi Mouth XII; Coffee Bay X;

Kologha Forest, Stutterheim. **A**: Grahamstown II; Albany V; Tsitsikama IX; Groot Rivier, Plettenberg Bay Dist I; Storms R Mouth; Wilderness I, II, IV; Port Elizabeth XII. **L**: Barberton III; Tzaneen XI. **H**: Johannesburg; Potchefstroom.

There is no record in the Natal Museum of the species being taken in grassland; although some specimens have been known to bite in the open, it was always close to tree cover. They are recorded biting cattle, dogs, horses and human beings, being attracted to cars and to light, biting at dusk (even in almost complete darkness), on bright days as well as heavily overcast days, and being caught in Harris Fly Traps.

T. immaculata Oldroyd 1957

SE: Port St Johns II, type locality.

T. schofieldi Usher 1965

E: Tugela R Mouth XI, XII, III, in woodland.

T. zoulouensis (Ricardo) 1914

Rhodesia. **E**: M'fongosi, type locality; N'Kwaleni; Durban XI; Nagel Dam IV; Inchanga, Hammersdale Dist I. **D**: Winterskloof, Pietermaritzburg II (a ♂ at 0100 hours at night); Town Bush, Pietermaritzburg II; Blackridge, Pietermaritzburg I, II, III; Hilton (at light). **L**: Swaziland, Mbabane.
Caught in houses at night after dark occasionally. From open parkland, forest and thick bush.

Genus *Thriambeutes* Grünberg 1906

Type species *T. singularis* Grünberg, by monotypy.

T. v-album Surcorf 1908

Malawi, P.E.A. and Rhodesia. **L**: Kruger Park III, V; Gravelotte, XI.

Tribe Bouvieromyiini

Genus *Erodiorhynchus* Macquart 1838

Type species *E. eristaloides* Macquart, by monotypy.

E. edentula (Wiedemann) 1828

W: Augustfontein, Calvinia Dist; Namaqualand; Wallerkraal; Bowesdorp and Richtersveld; Strandfontein X; Kamieskroon X; Niewoudtville IX, X; Springbok IX–X; Knersvlakte N of Vanrynsdorp X; Vioolsdrif VII. **M**: Mowers; Robertson Dist; Nardouw, Clanwilliam Dist; Saldanha Bay IX–XI; Worcester. **K**: Barrydale, Ladismith Dist; Willowmore IX.
These bee-like flies can often be caught on spring flowers and are then usually pollen-coated.

E. obtundata (Oldroyd) 1957

M: Hottentots-Holland, near Caledon 1 200 m, unique ♀ holotype, no date.

E. pusillus Schiner 1868

'Cape Province'. No detailed type locality. **W**: Papendorp; Olifants R.

Genus *Mesomyia* Macquart 1850

Type species *Tabanus vituli* Fabricius, by monotypy.

Subgenus *Bacloceras* Austen 1937

Type species, *B. turneri* Austen by original designation.

M. (*B.*) *turneri* (Austen) 1937

D: Van Reenen, Drakensberg XI, type locality.

This is known only on the unique ♂ holotype. The only other known member of the subgenus is a species from Madagascar also based on a single male specimen. However, the relationship and taxonomy are not certain.

Subgenus *Mesomyia* Meigen *sensu stricto*

Type species *Pseudoscaptia scoliiformis* Enderlein, by original designation.

M. (*M.*) *aurantiaca* Odlroyd 1957

M: Hottentots-Holland Mts, E side, 1 200 m, type locality: Oudebosch, Riviersonderend; Kirstenbosch; Platteklip, Table Mountain; Wit River Valley, Bainskloof XI–II.

M. (*M.*) *costata* (Loew) 1860

M: Clanwilliam; Somerset West XI. **W**: Augustfontein, Calvinia Dist; Melton Wold; Nieuwveld. **K**: Willowmore IX, I. **SS**: Near Craddock III. **H**: Bothaville IX–X.

The Cradock specimen was caught recently by Dr Irwin in open bushveld on a composite flower in mid March. It is dusted with pollen.

M. (*M.*) *decora* Macquart 1850

Mozambique, Rhodesia, Zambia, Congo, Tanzania. **B**: NE of L. Ngami; Vryburg IX, N Kalahari IX. **SWAn**: Gobabis; Otjo IX. **SWAs**: Omaruru. **SN**: Postmasburg, Griqualand. **NT**: Pretoria; Marnitz IX. **E**: Port Natal (Durban) type locality.

M. (*M.*) *hirsuta* (Ricardo) 1920

M: Ceres Dist; Matroosberg, 1 100 m, XI (♂, 1 ♀ only, type locality).

M. (*M.*) *namaquina* Oldroyd 1957

W: Namaqualand, Bowesdorp, type locality; Kamieskroon; Okiep IX.

Subgenus *Perisilvius* Enderlein 1922

Type species *P. nyassicus* Enderlein, by original designation.

M. (*P.*) *anomalus* Oldroyd 1957

E: Eshowe III, type locality, caught on a laboratory window; Ngotsche Gorge, Entomeni, Eshowe Dist II.

M. (*P.*) *algoensis* Oldroyd 1957

A: Algoa Bay, no date.

M. (*P.*) *argenteus* Oldroyd 1957

SE: Port St Johns X, XI, 1917, since when apparently no more have been found at the type locality despite the considerable number originally caught (all were males); however, the NM has a ♀ from East London which appears to belong to this species.

M. (*P.*) *barnardi* Oldroyd 1957

K: Seven Weeks Poort-Berg near Ladismith, 1 700 m–2 100 m XII. ♀ holotype.

M. (*P.*) *callosus* (Ricardo) 1920

E: Durban, type locality, XII.

M. (*P.*) *confluens* (Loew) 1858

'Kaffraria' no date or details. **E**: Eshowe XI–XII.

M. (*P.*) *contrarius* (Austen) 1937

SS: Katberg 1 200 m, type locality XI–I. **D**: Lundeans Nek, 2 100 m, and Naude's Nek, 2 525 m, Barkly East Dist.

The **D** specimens were caught on a sunny day in alpine grassland, in a sponge area.

M. (*P.*) *coriarius* Oldroyd 1957

M: Fernwood, Kirstenbosch ♂ holotype; ♀ paratype bred out in VII 1934 and XI 1933. No further records.

M. (*P.*) *cuneatus* (Loew) 1888

'Kaffraria', type locality. **E**: Port Natal (Durban); Upper Tongaat XI 1919; Drummond XII 1915. It is curious that this has not been recorded for more than 60 years.

M. (*P.*) *designatus* Oldroyd 1957

M: Kurfdebergen, E of Citrusdal, type locality; paratypes from Slanghoek Needle 1 350 m, Koue Bokkeveld, Ceres Dist; Cape Peninsula X–III.

M. (*P.*) *divergens* Oldroyd 1957

E: Port Natal (Durban), type locality; Durban, Greenwood Park X; Pongola Flood Plain III.

Mr K. Tinley writes that in Zululand specimens were attracted to a moving vehicle in dense thorn-veld containing patches of open woodland.

M. (*P.*) *marieps* Usher 1965

L: Mt Marieps, near Acorn Hoek, I.

M. (*P.*) *mossambicensis* (S. Dias) 1955

E: Manyana, Mseleni Mission Station XI, II; Mtinzini II; E of Lake St Lucia II; Ndumu XII; between Umlalazi R and Port Durnford; Dukuduku IV. Attracted to moving vehicles. Type locality, Maputo, Lourenço Marques Dist, Moçambique.

M. (*P.*) *provincialis* Oldroyd 1957

M: Olifants R between Citrusdal and Clanwilliam, type locality; upper sources of Olifants R. Ceres X–XII.

M. (*P.*) *redundus* Oldroyd 1957

Cape Province: Bosjuismansbergen II, unique ♀ holotype. I think this may be **W**: Bosjesmansberg, Prieska Dist, now written Boesmansberg.

M. (*P.*) *tinleyi* Usher 1965

E: Gwalaweni Forest, Lebombo Mts XII; in forest, biting man at dusk.

Subgenus *Pronopes* 1858

Type species *P. nigricans* Loew 1858, monotypic.

M. (*P.*) *constrictifrons* Oldroyd 1857

M: Cape Town unique ♀ holotype, no date.

M. (*P.*) *flavipes* (Hine) 1923

K: Willowmore, type locality I. **A**: Uitenhage II; Dr H. K. Munro caught 2 ♂♂ and 1 ♀ 'flying over water'.

M. (*P.*) *nigricans* (Loew) 1858

Cape Province, unique ♀ holotype, no further details or records.

Subfamily Tabaninae

Tribe Diachlorini

Genus *Amanella* Oldroyd 1654

Type species *Tabanus imbecillus* Karsch by original designation.

A. angusta Oldroyd 1954

A: Tradouw Pass, Langeberg Mts, type locality, I.

A. atra Oldroyd 1954

M: Michell's Pass, 5 km SSW of Ceres II, type locality, II, (in bush along river).

A. emergens Oldroyd 1957

A: Grahamstown (biting man) XII, I, II, type locality; Albany I.

A. furcata Oldroyd 1954

M: Ceres, upper sources of Olifants R, type locality XII; Table Mt 830 m; Wynberg, Cave Ravine XII.

A. ignota Usher

L: Haenertsburg XII; Mt Elembe, near Havelock Mine (in forest patches) II; Woodbush, near Tzaneen (in high forest) XII.

A. ingridina Usher 1965

E: Empolweni Valley, Gillitts XII, II, type locality. To be found flying at great speed over the Impolweni R in gallery forest, and in surrounding area. Bites man and flies to cars.

A. medialis Oldroyd 1954

D: Harding, type locality; Balgowan; Town Bush, Pietermaritzburg XII; Blackridge, Pietermaritzburg II; Winterskloof, Pietermaritzburg I (biting man and dog); Geekie's Farm, Karkloof XII, I. **L**: Barberton.

E: N'Kandhla. In Natal this is a species of escarpment mist forest and bush, and is not uncommon. I have caught it biting a horse in open grassland near a patch of forest, and several flew into a Harris Fly Trap in open parkland. It is silent, unobtrusive, seems to prefer biting animals (dogs, horses and cattle) on the legs, under the belly or on parts in shadow, and is known to bite human beings and fly to cars also.

A. minor Oldroyd 1954

M: Hugenot (type locality); 3 km SW of Villiersdorp, II, at roadside pond.

A. nana Oldroyd 1954

A: Oudebosch, Caledon 450 m; Cape Town I, II. **SE**: Port St Johns XI.

A. pondo Oldroyd 1954

SE: Port St Johns XI.
A silent, furtive species with glowing green eyes, found in forest, attracted to man and vehicles.

A. sulcipalpus (Loew) 1858

'Kaffraria', type locality. **A**: Wit River Valley; Cambria Area, Patensie Dist.
Caught beside fast-flowing mountain streams with a gravel bed and shallow gradient. One stream flowed through grass and macchia, and the other through *Podocarpus* forest. Most records were of sunny days but one was cloudy. The flight is silent, the eyes glow green in life. The species can be found flying in both sun and shade.

A. shaka Usher 1970

D: Pateni Tea Estates, Richmond XI. Found on a steep slope with montane grass, well away from forest in hot, sunny weather. Another specimen was caught in a Malaise trap. The flight is slow; eyes green in life.

A. zimbiti Usher 1970

D: Zimbiti Forest, 11 km NE of Kranskop XI. A very large species; most specimens were caught near a small stream in gallery forest. A male was found on a leaf overhanging a marshy area. Several were taken on one hot sunny day and the species has not been seen since.

Genus *Limata* Oldroyd 1954

Type species *Tabanus tenuicornis* Macquart, by original designation.

L. bedfordi Oldroyd 1954

E: Ntambanana and Hluhluwe I, II.

L. capensis (Wiedemann) 1821

W: Namaqualand, Wallerkraal. **M**: Leipoldtville; Elands Bay; Clovelly, Cape Peninsula X; 6½ km S of Clanwilliam X; Pakhuis Pass IX; Cape Town X; Arniston Dunes, Bredasdorp Dist X; Ysterfontein X. **A**: Grootrivier, Plettenberg Bay I. **K**: Willowmore X.

At Ysterfontein a teneral specimen was flying over beach sand. On the extensive Arniston dunes, among the scrub both on the landward and seaward faces, this species was very numerous, flying to cars and human beings, bee-like in both noise and appearance as well as very fast on the wing.

L. facialis Oldroyd 1954

M: Skoorsteenkop, Hout Bay, Cape Peninsula, type locality II, (in insect trap).

L. kuhnelti Usher 1967

SWAs: Gobabeb III. Both sexes flew to light.

L. laevifrons (Loew 1858)

Cape. No further details. The type appears to be lost, and the species has not been recognized since the description.

L. miranda Usher 1968

D: Hogsback, North of Alice XI, type locality. 11 km NE of Kranskop (♂) X; Ingeli Forest, Weza Dist XII.

The holotype flew to a Land Rover parked in forest off a road. It was silent in flight. The male was resting on a stone beside a stream in a forest. The third specimen was caught by Mr Oatley under conditions almost identical to the holotype, but whereas the latter has tergites 2 and 3 conspicuously orange-brown, the Ingeli specimen is almost entirely black, only slightly brownish around the white markings. The general appearance of the latter is consequently strikingly at variance, but except for the antennae which are more slender and darker, and a general darkening of the colour pattern, its microscopic features compare well with those of the holotype. This is probably simply a melanic variation, but more material is essential to clarify the problem.

L. parafacialis Oldroyd 1957

A: Grahamstown, type locality, Sheldon XII.

L. tenuicornis (Macquart) and s.sp. *karooensis* Oldroyd

Distribution given by Oldroyd—*f. typ.* **W**: Calvinia; Augustfontein; Olifants R Papendorp; Namaqualand, Knersvlakte—'i.e. probably from the (**M**) Cape Flats up to the Orange River', IX–X. Subspecies *karooensis* —**K**: Moordenaars-Karoo; Lammerfontein, type locality; Willowmore, Vondeling; Oudtshoorn; Zebra; Waterval; Tankwakaroo; Rooinek Pass, Laingsburg Dist X–XI.

The specimens in the Natal Museum do nothing to elucidate this distribution pattern so are listed separately. *F. typ.* **M**: Strandfontein coast X. s. sp. *karooensis*—**W**: Brandkop, Calvinia Dist X, (on the same day at the same place an intermediate specimen was caught); from Papendorp, Olifants R. X, and Springbok near Pofadder, in early spring came two other intermediate specimens.

Genus *Neavella* Oldroyd 1954

Type species *Tabanus producticornis* Austen, by original designation.

N. producticornis Oldroyd 1954

Kenya, Zanzibar, Pemba and Moçambique. **A**: Kasouga I.

This is a coastal species, with only one record inland at a small lake not far from the coast. The Cape record is very far south of the known distribution, but I have checked the specimen carefully, and, although there is some variation, I cannot find sufficient grounds to believe it is a new species. The specimen is dated 1927; no further records of the species are available, which is curious.

Tribe Tabanini

Genus *Ancala* Enderlein 1922

Type species *Tabanus fasciatus* Fabricius, by original designation.

A. africana (Gray) 1832

From S Sudan to Natal. **SWAn**: Okovango, Kuring Kuru; Kunene R IX–V. **E**: Umbilo III; Ndumu I, IV, X, XI, XII; Mkuze X; Lake Sibaya XII. This species has been observed biting man, dogs, cattle, goats and hippopotami. It is attracted to light. (For further information see *T. taeniola* P. de B.) To be found near the main surface waters on the Zululand plains, following the distribution of large mammal.

Genus *Atylotus* Osten-Sacken 1828

Type species *Tabanus rusticus* Linnaeus, by original designation.

A. agrestis (Wiedemann) 1828

Distributed throughout the Ethiopian savannas and far into the Palaearctic and Oriental Regions. Type locality, Egypt. **E**: Ndumu II, IV, V, VI, X, XII; False Bay III. **NT**: Bapsfontein XI; Pretoria XII. **SE**: Umgazi R Mount XII. **SWAn**: Etosha Pan III.

Often swept from grass and scrubland. In Ndumu Game Reserve large numbers flew into huts in the camp site which is in open parkland. No record in the NM is from forest.

A. diurnus (Walker) 1850

M: Cape of Good Hope, unique ♀ holotype, no date.

A. fulvianus (Loew) 1858

'Kaffraria.' **SN**: Delareyville VIII, XII, Oldroyd dates XI–I. Possibly also the Congo.

A. fuscipes (Ricardo) 1908

Much the same distribution as *A. agrestis* in the Ethiopian Region. **D**: Chelmsford Dam, Newcastle II; Blood River Vlei, Utrecht I. **SE**: Orange Grove, Blaney Junction I; Umgazi Mouth XII. **NT**: Pretoria XII;

Marico R XII. **L**: Swaziland XII; Louis Trichardt I. **E**: Ndumu XII. Less numerous in Natal Museum collection than *agrestis* but also taken in grassland, scrub and open parkland.

A. nigromaculatus Ricardo 1900

NT: Pretoria, type locality. **SN**: Delareyville. **D**: Weenen; Chelmsford Dam, Newcastle II; Blood River Vlei, Utrecht I; Verdruk Dam, Hattingspruit I; Estcourt; Dundee II. **H**: Mamathes XII; Tlametlu R, Lesotho; Roma I; Gum Tree; Marquard I.

Several were swept from weedy old lands at Roma. At Blood River they were attracted to a moving vehicle. Males, thought to be of this species, are known from Malawi.

Genus *Euancala* Enderlein 1922

Type species *Tabanus maculatissimus* Macquart, by original designation.

E. maculatissima (Macquart) 1838

Only the typical form is known from South Africa; it is widely distributed in the Ethiopian Region. **D**: Blackridge, Pietermaritzburg; Town Bush, Pietermaritzburg IV; Karkloof XII. **E**: Eshowe XI, XII; Ntambanana XI; Ingwavuma V; Mtunzini III; Pietermaritzburg XII. **SE**: East London; Kentani. **A**: Kleinemond, Bathurst Dist XII; Albany Dist X. **L**: Barberton.

Males can be found on flowers. Females in East London were biting cattle in scrubland, but they have been taken in parkland and bushy terrain near streams. Males and females have been observed sucking water at a mud patch in montane forest on the Vumba Mountain, Rhodesia, by Cookson (1967).

Genus *Tabanus* Linnaeus 1758

Type species *T. bovinus* Linnaeus, by designation of Latreille, 1810.

chevalieri group

T. chevalieri Surcouf 1903

Widespread throughout the Ethiopian Region. **M**: Swellendam Dist; Clanwilliam. **W**: Klawer; Upper sources of Olifants R, Ceres. **E**: Ntambanana X. **NT**: Pretoria IX. **A**: Van Stadens Pass II; Tradouw Pass, near Swellendam, XI. **D**: Bushman's R, Moor Park Nature Reserve, Estcourt Dist IV; Helpmekaar Dist IV.

T. saxicolus Usher 1965

D: Royal Natal National Park IX; Giant's Castle Game Reserve IX. This may be a synonym of *T. chevalieri*, but the type series are larger, brighter and less hairy than any *T. chevalieri* in the Natal Museum. All were caught in spring, resting on boulders in the bed of a mountain stream running through grassland, and made conspicuous by their glowing green eyes.

T. vexans Loew 1858

M: Ceres XI. **A**: Otterford Forestry Reserve, Hankey Dist XII. Resting on stones in a stream of shallow gradient running through open bushland. Victorin, who collected the type material, operated for a year (1854–5) in the George and Knysna areas (Brinck, 1955). The type locality is almost certainly the Outeniqua Mountains, which is approximately midway between Ceres and Otterford.

sufis group

T. gratus Loew 1858

Distributed throughout entire Ethiopian Region outside the equatorial forest region. **E**: Umbani Valley, Ubombo; Ngana Research Lab.; Ngxwana Hill III; Ndumu V, IX, XI; Mtubatuba I; Lake Sibaya XII. **NT**: Pretoria II. **D**: Royal Natal National Park V; Ladysmith II. **L**: Crocodile Motel 13 m W of Nelspruit II; Pafuri block, Kruger National Park V; Acornhoek XI. **SWAs**: Kowares, Kaokoveld VII. Found in grassland and open parkland.

T. impertinens Oldroyd 1954

K: Waterval, Tankwa-karoo XI, type locality; Renoster R. Tankwakaroo; Lammerfontein, Moordenaarskaroo X; Rooinek Pass, Laingsburg Dist X; Oukloof, Beaufort West; Vanwyksdorp, near Ladismith, X XI; 75 m N of Touws River XII; Willowmore II. **W**: Brandkop Valley near Niewoudtville X.

T. leucostomus Loew 1858

Widespread in the Ethiopian Region. **SWAs**: Kuisip R type locality; Brandberg II; Anabib (Orupembe); Kaokoveld (at water-hole) VI; Hoarusib R, Otju; Kaokoveld; Aisis. **SWAn**: Otjiwarongo. Collected in most months in S.W.A. & W. Cape. From Henkries, Botswana, down to the Nieuwveld escarpment and Laingsburg Dist (Oldroyd 1954). **W**: Brandkop Valley near Nieuwoudtville X; Prieska; Namaqualand XI; Kakamas; Kenhardt Dist V; Rietvlei, Nieuveld escarpment I; Springbok XI. **M**: Robertson XII; Koup Siding, Laingsburg X; Beaufort West II; Willowmore XI; Merweville II. **SS**: near Cradock III; Zebra National Park III. **D**: Blackridge, Pietermaritzburg II (in Harris Fly Trap). **E**: N'Kwaleni XI, I; Mfongosi XII–II. **A**: Resolution, Albany Dist II.

Recorded from dry desertic scrub as well as open, well watered parkland; flies to cars and large animals.

T. minuscularius Austen 1912

Moçambique. **E**: Ngxwala Hill; Mfongosi XII; Mkuze I; Nkwaleni. **NT**: Rooiberg XII. **L**: Kruger Park XI; Skukuza, Kruger Park II; Nelspruit XI; Bosbokrand (Bushbuckridge) II; Louis Trichardt; Barberton; Hlatikulu II. **D**: Pateni Tea Estates, Richmond XI; Dundee II; 18 km SE Ladysmith II. (Oldroyd's date XI–IV)

Inhabiting small clumps of trees and bushes in open grassland on a steep slope and biting freely at Pateni, Richmond.

T. obliquemaculatus Macquart 1838

Cape Province, unspecified localities. **SWAn**: Aab XII. **K**: Willowmore II.

T. pertinens Austen 1912

A savanna species ranging from Sierra Leone to unspecified localities in Zululand, collected in all months. The aquatic larvae live among the roots of grasses and water plants, apparently preferring rivers with a sandy bottom. No South African specimens in the NM. Oldroyd's (1957: 476) record of the species from **M**: Piquetburg, is surprising.

T. taeniatus Macquart 1834

M: Ceres; Swellendam; Du Toit's Kloof IX; Simonstown; upper sources of Olifants R, Ceres XII; Witte R, Wellington 1 500 m; Gt Winterhoek, Tulbagh 1 100 m; Table Mountain, Cape Town; Citrusdal Dist XI; Hottentots Holland Mts, Caledon 1 050 m; Kleinmond XII; Orange Kloof, above Hout Bay. **SS**: Aliwal North. **K**: Meiringspoort. **A**: Tradouw Pass, Swellendam Dist XI; Coldstream, Nature's Valley, Tsitsikama XII; Tsitsikama X; Kareedouw Mts X; Groot R, Plettenberg Bay I; Bo-Kouga, Uniondale Dist III. **D**: Lundean's Nek and Naude's Nek, Barkly Dist I; Giant's Castle Game Reserve XI, XII, II; Karkloof XI, XII; Drakensberg, van Reenen. **H**: Blue Mountain Pass, Maluti Mts, Lesotho I; Oxbow, Lesotho I; near Semonkong, Lesotho I. **SE**: Port St Johns.

Often caught in open or bushy habitats. In the Barkly East District it was quite numerous in alpine grassland near mountain streams. No NM records from forest.

insignis group

T. atrimanus Loew 1858

Widespread in the Ethiopian Region. 'Kaffraria'. **E**: N'Kwaleni II; Eshowe XI, I; Mfongosi II; Ntambanana; Melmoth Rd; Doonside, Natal S Coast II; Oribi Gorge II. **L**: Mariepskop X; Kaapmuiden. **NT**: Pretoria XII: **SE**: Coffee Bay X; Port St Johns X. **A**: Wilderness I. **H**: Parys.

Males have been found hovering over streams. Females attack large animals, human beings and vehicles, and can be caught in a Harris Fly Trap. No NM records from forest.

T. insignis Loew 1858

Distributed throughout the savannas from Sierra Leone to Natal. 'Kaffraria'. **E**: Eshowe X–XII; St Lucia Bay X; Mfongosi; Mangusi R, Hlabisa XII; Ndumu; Blackridge, Pietermaritzburg II, III; Kettlefontein, Pietermaritzburg I; Upper Tongaat XI, XII. **D**: Normandien Dist II; Umhlatuzi R X. **H**: Magaliesberg II. **NT**: Entabeni Forest Station, Zoutpansberg 700–1 000 m, II. **L**: Kaapmuiden I.

Frequently caught in Harris Fly Traps. No NM records from forest.

T. variabilis Loew 1858

South African to Uganda and virtually from coast to coast. **D**: Cathedral Peak I, II (biting man beside a mountain stream); Pateni Tea Estates XI; Royal Natal National Park I; Hilton Road I; Kettlefontein, Pietermaritzburg II; Karkloof near Mt Alida XII; Blackridge, Pietermaritzburg XII, II; Town Bush Valley, Pietermaritzburg II. **E**: Umhlatuzi R XI; Eshowe; Upper Tongaat XI. Females caught in Harris Fly Trap.

pullulus group

T. copemani Austen 1912

Zambia, Malawi, Rhodesia. **L**: Tablet Koppies, Tshokwane, Kruger Park III. **B**: Tsessebe I.

T. pullulus Austen 1912

L: Tshokwane, Kruger Park III.

ruficrus group

T. biguttatus Wiedemann 1838

Widespread from the Cape of Good Hope and Mossel Bay, to 150 N of Equator. **E**: Charters Creek; SW Lake St Lucia II; Mfongosi; Hluhluwe III (on buffalo); Pongola Flood Plain; Ndumu IV, IX, XII; Lake Sibaya XII; Mtunzini II; Durban X; Port Shepstone I; Stellabush, Durban; Scottsville, Pietermaritzburg I; Blythedale Beach III. **D**: Muden I. **NT**: Onderstepoort. **SE**: (Ngamakwe) Namaqua XII; Fort Beaufort. **A**: Port Elizabeth XI, IV; Kasouga XII. **M**: Bredasdorp XII; Maanschijnkop 11 km E of Hermanus (in dry heath) XII.

A well-known species; the mud cylinders of the larvae in vleis and pans enable them to survive desiccation. Males settle on tree trunks and large stones, and have been seen drinking at water. On a hot spring midmorning in Moçambique I walked through a plantation of trees near a stagnant pool and on almost every trunk was a newly emerged *biguttatus* female; not one of this daunting assemblage attempted to bite. Mr Tinley collected specimens on the margins of a seasonally inundated marsh amongst watergrasses on the Pongola Flood Plain (see *T. taeniola*).

T. corax Loew 1863

SN: Bloemfontein. **H**: Monethis near Teyateyaneng I. **D**: Giant's Castle Game Reserve XI.

The Lesotho specimen was misidentified as *biguttatus*; *corax* resembles that species but is totally black. Possibly the mistake is not unique for the species had gone undetected for 100 years apparently despite the accessibility of its habitat.

plain group

T. brunneus Thunberg 1827

Cape Province. No exact locality or date. The description is inadequate and the species has not since been recognized. Oldroyd suggests it is synonymous with *T. zoulouensis* Bigot.

T. par Walker 1858

From Gambia to Natal. **E**: Lake Sibaya XII; Ndumu I, IV, V, IX, X, XI, XII; St Lucia Mt Ntsengwane area, NE of Lake St Lucia II; Nsese Lake T; Empangeni I; Charters Creek X, XI, II; Gingindhlovu IX; Lake Sibaya XII; Mtunzini III; Mapelana II; Durban II; Tongaat IX; Stellabush, Durban X. **SE**: Port St Johns. **A**: Assegaaibos I.

This is an inconspicuous fly often going undetected until swept out of vegetation. No record is in the NM from forest in the above localities. Specimens may be common in grassland, open parkland and near water or in low vegetation up from the sea shore.

T. thoracinus Palisot de Beavois 1807

Apparently this very widespread species is distributed throughout the Ethiopian Region in savanna and high forest. It is not recorded from the Cape Province. No South African specimen has been collected for the Natal Museum yet. **NT**: Rustenburg XI.

T. zoulouensis Bigot 1892

A widespread species, the type locality is given as 'Cap. b. sp. Pretoria'. Oldroyd lists **E**: Eshowe IX; Mposa; Empangeni Dist IX. However, I have been unable to discover a single South African specimen in the NM despite much searching among the specimens of *par* for one with black legs (a distinguishing feature), in the hope of a misidentification.

patterned group

T. albilinea Walker 1848

M: Cape of Good Hope (type locality). **SS**: Katberg; Kentani V. **D**: Newcastle; Estcourt; Drakensberg, Van Reenen I; Greytown XI. **SE**: Port St Johns XI, I. At Port St Johns, a light-grey Land Rover parked on an open, grassy slope above indigenous forest attracted a number of specimens which flew at the car at tremendous speed, often diving beneath into the shadow.

T. barclayi Austen 1912

Malawi, Moçambique, Zambia. **NT**: Junction of Crocodile and Marico Rivers. **E**: Ngxwala Hill; Ndumu II; Mkuze I. **L**: Tshokwane, Kruger Park XI; Nyandu, Sandveld, Kruger Park XI.

T. denshamii Austen 1908

Very widespread from Abyssinia to Zululand. **E**: Mtunzini. Overall dates IX–XII.

T. fraternus Macquart 1846

From South Africa to Abyssinia. **E**: Mkuzi I; Ndumu III. Most specimens in the NM are from areas north of South Africa. It is easily confused with *taeniola* but has only three median abdominal triangles.

T. laverani Surcouf 1907

Widespread but no truly forest records. **E**: Ndumu; Hluhluwe III; St Lucia.

T. nyasae Ricardo 1900

Occurs mostly north of South Africa but there is one Zululand record. **E**: Mposa X.

T. sericiventris Loew 1858

NT: Springbok Flats; Pretoria Dist XII; Groenkloof XI; **H**: Potchefstroom; Bloemfontein XII–II; Delareyville. **B**: Vryburg 1 050 m II.

T. taeniola Palisot de Beavois 1807

I have not separated the two forms recognized by Oldroyd because of numerous intermediates. From Senegal to the Orange Free State, a common species, known as the 'hippo fly' in eastern Africa. **E**: Hluhluwe on Rhino I, III; Mfongosi; St Lucia Bay; Ndumu X, XI, XII; Charters Creek II; Mkuze X, IV; Pietermaritzburg X, XI (on Museum window, 1909). **D**: Blackridge, Pietermaritzburg I; Weenen. **L**: Phalaborwa IV. **H**: Potchefstroom. **SE**: Port St Johns II; Kentani. **NT**: Bapsfontein XI. **M**: Witsands, Cape Peninsula.

Primarily this is a species of open country, able to exist in forest only where there is a break in the canopy or the forest is in patches. It is a well-known species, attracted to cars, large animals and human beings, to be found abundantly on the Zululand plains and in game reserves near open water, following the distribution of large game and domestic animals. 'The blood-sucking activities of three common species of Tabanidae, *Tabanus biguttatus* Wied., *T. taeniola* P. de B. and *Ancala africana* (Grey), have an important influence on the summer diurnal activity of hippopotamus in North-Eastern Zululand. Because of the presence of large numbers of these flies, in conjunction with high solar radiation, hippopotamuses are obliged to remain more or less submerged during daylight hours, and can forage on shore only at night' (Tinley, 1964).

Studies in Egypt by Hafez, El-ziady & Hefnawy (1972*a*, *b*, *c*) and El-ziady & Hefnawy (1972*a*, *b*), on the biology, ecology, morphology, immature stages and feeding habits of *taeniola*, are very interesting and comprehensive. No similar work has been undertaken in South Africa. The cultivation of land in the area studied obviously did not diminish the numbers of tabanids, which fed on the grazing domestic animals and bred in canals. In South Africa civilization, urbanization and farming practices would appear to have reduced the numbers or even caused the extinction of some species, and *taeniola*, previously recorded in the Pietermaritzburg area, is now rarely found in Natal away from the game parks. Hafez *et al.* also note that the noisy attack of *taeniola* is more disturbing to animals than the silent flight of *T. sufis* and *Atylotus agrestis*.

The Cape Peninsula record (Lindner, 1961) is strange; I cannot imagine how the species came to be so far south.

T. ustus Walker 1850

Widespread in the Ethiopian Region. 'Kaffraria'. **E**: Mtunzini XI; Ndumu X; Eshowe XI; Lake St Lucia X; M'posa XI; Tongaat; Scottburgh XI; Durban III. Known to attack man, dogs and cattle.

Tribe Haematopotini

No species of the genus *Hippocentrum* is known from South Africa.

Genus *Haematopota* Meigen 1803

Type species *Tabanus puvialis* Linnaeus 1761.

bullatifrons group

H. daveyi Austen 1912

Malawi and Rhodesia. **B**: Nata River XII; **E**: Mkuzi I–IV; Males taken in light trap.

distincta group

H. anomala T. S. Dias 1956

The type specimen, from Kaapmuiden near Nelspruit, on the Crocodile R, is in the NM. I am convinced that it is teratological and is unacceptable as a type specimen under Article 1 of the International Code of Zoological Nomenclature. All the Tabanini I have seen have been singularly uniform, none has anything approaching the bizarre malformations of *H. anomala*. This interesting specimen is probably a deformed *H. imbrium* with which it is compared by Dias. The extent of the wing pattern and the prominence of the median stripe of *H. imbrium* are both variable.

H. imbrium Wiedemann 1828

Rhodesia. **E**: Umhloti I; Oribi Gorge XI; Umhlanga Bush XI (coastal forest); Durban V; Umtamvuma R Mouth XI. **D**: Tugela R near Winterton; Royal Natal National Park I, IV; Muden X; Lions Bush, Nottingham Rd (IV); Town Bush, Pietermaritzburg X, XII; Kingsley Dist III; The Glen, Dundee area I; Grootgewacht Dam, Vryheid Area II; Strathcona Farm, Vryheid Dist I; Vryheid III; Cathedral Peak II; Greytown; Castledene, Underberg Dist I; Deeside, Cedara I; Kranskop XII; Dargle XI; Botha's Pass II; Nhlazane Mt., Dargle Dist; Cundycleugh Dist III; Dalton XI. **H**: Johannesburg; Harrismith; Mamathes XI, I. **SN**: Delareyville (De la Rey). **L**: Tzaneen IV. **SE**: Port St Johns XI; Kologha Forest; Stutterheim II; Cata Forest, Keiskamahoek III; Bonza Bay, East London XI. **A**: Grahamstown III, IV, V, X, XI; Grootrivier, Plettenberg Bay Dist I, XII; Port Elizabeth XII; Humansdorp IV; Kabeljouws River I; Keurbooms River, Plettenberg Bay Dist; Knysna XII.

Large numbers pester cattle in Natal in summer. In Town Bush, Pietermaritzburg, they are to be found in open glades in the forest, in forest margins, open parkland and open pastures. I have not seen them in thick forest.

H. recurrens Loew 1858

E: Port Natal, no date. This is very probably a synonym of *imbrium*, as Oldroyd suggests. No specimen from the Natal coast is sufficiently different to be outside the range of variation of *imbrium*; more collecting is desirable before the synonymy is made, but *recurrens* is not included in the tables and faunal analysis given below.

hirta group

Only two species are known from South Africa, the other three species are from Equatorial East Africa and Abyssinia.

H. montisdraconis Usher 1965

D: Naude's Nek, Barkly East Dist I, type locality; **H**: Sani Pass, Lesotho XII; Thabana Ntlenyana, Lesotho I.

All specimens were swept from alpine grassland, a mixture of coarse grasses and small flowering plants around a sponge area, in summer. They showed no interest in humans or a Land Rover, and were lethargic.

H. quathlambia Usher 1965

D: Cathedral Peak, Drakensberg 2 070 m II, type locality; Giant's Castle Game Reserve, Drakensberg 1 770 m X.

The type specimen was in *Themeda* grassland where it flew to light-grey Land Rover in midsummer. The next to be caught was resting on a stone beside a stream, in spring. Both were weak in flight and lethargic.

mordens group

H. circumscripta Loew 1858

Rhodesia, P.E.A. III, V. **H**: Johannesburg I, II; Elands R, Middelburg Dist III. **NT**: 37 km NW of Naboomspruit.

H. maculosifacies Austen 1914

E. Africa, Moçambique. **M**: Elsenberg, Stellenbosch, no further details. The nearest record in the NM is in the Dondo Forest, Moçambique, and the S.W. Cape record is suspect.

H. pardalina Oldroyd 1952

Moçambique. **E**: Mtubatuba; Nzunde, Lake St Lucia XI–II; Dhlosi Peninsula, Lake St Lucia III; Kosi Lake Reserve XII; Ndumu XII, I; M'posa, Umfolosi Dist. II; False Bay Flood Plain II: Ndumu I (in savannah on large moist glade).

H. transvaalensis Carter 1915

NT: Onderstepoort XII, III.

tumidicornis group

H. bedfordi Oldroyd 1952

H: Carolina, I, type locality.

H. bistrigata Loew 1857

H: Carolina I; Eikenhof, Johannesburg XI; Piet Retief. **D**: Cathedral Peak, Drakensberg XII; Giant's Castle Game Reserve X; Vryheid Dam I; Kingsley III. **E**: Clairmont, Durban IV.

H. infernalis Oldroyd 1952

M: Cape Flats, West London (type locality), I cannot find this name on a map. **SWAs**: Swakop, Walvis Bay X. This may well be a member of the *ocellata* complex (see below). Abdominal stripes, the key character for *infernalis*, are commonly found in northern specimens of *ocellata*.

H. mephista Usher 1965

D: Town Bush, Pietermaritzburg XI, XII, type locality; Karkloof XII; Winterskloof XII, II, III; Umkomaas Valley, Richmond IX.

Usually associated with forest or at least open parkland and forest fringes. Mr Oatley recorded one in open pastureland in the Umkomaas Valley. Occasionally found at light.

H. megaera Usher 1965

A: Kareedouw Mts X, type locality; Elandsberg Mts, Otterford, Patensie Dist XII.

Found in grass-shrub vegetation near a small stream on the edge of pastureland.

H. ocellata Wiedemann 1819; *H. obscura Loew* 1857; *H. spectabilis* Oldroyd 1952

I have tentatively grouped these species together, being quite unable to decide where the specific boundaries lie. Increasingly more material has become available for study and reveals that this apparently is either a very variable single species or a complex of very closely associated species which only biometrical analysis may be able to elucidate. Two specimens of *H. obscura* from the Berlin Museum, both labelled 'type', are indistinguishable from undoubted *H. ocellata* from the S.W. Cape. The holotype of *H. spectabilis* is from Richmond in the Karoo, a dry area. From Niewoudtville where a paratype is recorded the NM has a series of well over 100 specimens showing predominantly *spectabilis* characters but with sufficient variation and the inclusion of *ocellata* characters to be perplexing. When linked with specimens from localities ranging from Nieuwoudtville and the dry Karoo areas to the damper areas of the S.W. Cape (still winter rainfall), then around the coast to all-year-round and finally summer-rainfall areas, the variation appears to be continuous. There is a predominance of characteristic features in different type of habitat, the most perfect '*ocellata*' specimens being from M (S.W. Cape) and the most extreme '*spectabilis*' from dry, high areas in Lesotho (H).

M: Citrusdal Dist IX; Clanwilliam II; Het Kruis X; Leipoldtville X; Ysterfontein X, IX; Grey's Pass X; Fish Hoek X; Rondvlei, Cape Town V, X; Table Mountain, Cape Town X, XI; Cape Point Nature Reserve IX, X; Hout Bay and Kommetjie, Cape Peninsula XII; Stellenbosch IX, X, XI; Witsands, Cape Peninsula (in meadows and macchia) XI; Pakhuis Pass X; Graafwater X; Augustfontein IX; Goedehoop X; Kleinmond, in heath, XII; Mamre, in *Eucalpytus* grove at pond XI; Melkbosstrand, Cape Peninsula X; Wynberg. **SN**: Richmond X, type locality of *spectabilis*. **W**: Vanrynsdorp, Niewoudtville X; Strandfontein X. **K**: Seven Weeks Poort X; 56 km N of Touws R X; near Touws R XII; Swartbergpas, Platberg, about 1 500 m, I. **SS**: Lundean's Nek and Naude's Nek, Barkly East Dist I; Colesberg XII; Steynsberg XII. **A**: Robinson's Pass near Mossel Bay XII; Keurbooms R XI, I; near Albertina X, XI (open grassland with cows) I, II, III, IV, XI, XII; Kareedouw Mts (in cattle pasture) X; Bathurst X, XII; Grahamstown I, II, IX, X, XI, XII; Port Elizabeth (macchia with Port Jackson Willow) IV, X, XI; Plettenberg Bay I; Grootrivier Bay I, X; Alicedale XII; Knysna I, II, IV, XII; Coldstream, Tsitsikama Dist X; Otterford and Elandsberg Mts, Patensie Dist X. **SE**: Bonza Bay XI; Gonubi R Mouth near East London XI; East London IV; Hogsback X; Port St Johns XI. **E**: Oribi Gorge XI; Scottsville, Pietermaritzburg XI; Umbilo IX, X; Umhlanga Bush near Durban XI. **D**: Enon Forest, Richmond Dist; Karkloof X, XI, XII; Noodsberg XI; 'Castledene', Underberg Dist I, XI; Kranskop I; Kilgobbin Forest, Dargle XI; Ingeli Forest XI; near Greytown I; Giant's Castle Game Reserve X, XII; Normandien Dist II; Vryheid III; Tshekane Stream, Keat's Drift Road, near Muden I. **H**: Harrismith XII; Little Bokong R I; near Rafanyana I; Thabana, Ntlengana I; near Semonkong I; Kroonstad I; Rametseidiso I.

As all known habitat records of *obscura* in Natal were once from forests, and the variation of the specimens is slight, there seemed grounds for keeping this as a separate species. However, there are now reliable records from grasslands, especially in the Drakensberg foothills, and specimens from Oribi Gorge show similarities with specimens from further south. The southern specimens are from pasture, macchia and scrubland, but none that I know of are from forest.

H. ovazzai T. Dias

SS: Aliwal North XII, 1 ♂ holotype, not in good condition.

H. rubidicornis Oldroyd 1952

E: St Lucia (attacking man in forest) type locality; E shores of central Lake St Lucia II; St Lucia XI; Mosquito Hill Area, Lake St Lucia II; Hluhluwe Reserve III. Oldroyd's dates are IX, IV.

H. scutellaris Loew 1858

Kaffraria. No further details or records.

H. theobaldi Carter 1915

NT: Onderstepoort XII; Pretoria XII; Soekmekaar. **L**: Tzaneen. **D**: Lundean's Nek 2 100 m I and Naude's Nek 2 525 m I, both Barkly East Dist; Estcourt; Weenen; Royal Natal National Park I; Castledene, Underberg Dist; De Jager's Drift, Kingsley Dist III. **H**: Lekalabetsi R III; Quacha's Nek I; Roma Mission, upper Cave Sandstone level 2 000 m I; Mashai R I; near Morija I; Mamathes. Caught in grassland and pastures.

vitatta group

H. albihirta Karsch 1877

H. diasi T. Dias, 1956, *Mem. Est. Mus. Zool. Univ. Coimbra* **244**: 7–10. **syn. nov.**
H. tropai T. Dias, 1956, *Mem. Est. Mus. Zool. Univ. Coimbra* **244**: 11–13. **syn. nov.**

The holotypes of both the synonyms fall within the range of variation of *H. albihirta* material in the Natal Museum. *H. tropai* is from Reunion West and *H. diasi* from Bapsfontein.

A common, widespread species occurring in the savannas on the east of the continent. **NT**: Bapsfontein XI; Magaliesberg Mts near Brits II. **L**: Komatipoort I; Shingwedzi, Kruger Park V; Skukuza, Kruger Park XI. **E**: Lower Umfolosi I; Mtubatuba I; Hluhluwe I; Umhloti I. **D**: Tshekane Stream, Keat's Drift Road near Muden I; Strathcona Farm, Vryheid I; Utrecht II; Kingsley III; Castledene, Underberg Dist III. **SE**: Port St Johns.

H. bipunctata Ricardo 1906

H: Volksrust; Standerton IV; Argent, XII; Harrismith; Malubalube Stream, Teyateyaneng XI; Peka I. **D**: Lundean's Nek, Barkly East Dist I; Waschbank near Ladysmith XI; Kingsley Dist III; Castledene, Underberg Dist III. **SS**: Steynsburg X. **M**: Cape Town.

This species appears to be restricted to the highlands and the escarpments. In Underberg it was attracted to a truck and to human beings, together with *H. theobaldi* and *H. ocellata*, from open grassland near a stream (Mr Oatley). At Lundean's Nek it was high on the mountain near a sponge area in alpine grassland.

H. decora Walker 1850

Widespread in Africa. **B**: Ngami. **E**: Ntambanana, Empangeni Dist; Mkuze R; Umhlatuzi R X; Tete Pan, Ndumu IV; Kosi Bay V; Umgeni X; Nagel Dam, Botha's Hill X; Umhloti I; Glendale Heights, Umhlali Region 600 m. **D**: Saltpans Valley, Richmond XII; between Keat's Drift and Muden I. **SWAn**: E Caprivi VI.

Obviously insufficient collecting explains the broken distribution pattern of this unobtrusive, furtive species. Mr Oatley observed them resting above the root of cows' tails, out of reach of the swishing. On the bark of a tree the black-and-white colouring is not cryptic but does suggest a bird dropping.

H. duplicata Loew 1857

Natal, no details. **SE**: East London I.

H. vitatta Loew 1858

Very widespread in the Ethiopian Region. **D**: Van Reenen, Drakensberg III. **E**: Scottsville, Pietermaritzburg XI, XII; Nagel Dam IV; Mtubatuba I; Tongaat; Ndumu IV. **L**: Pretoriuskop, Kruger Park I; Skukuza, Kruger Park XI; Komatipoort I. **SWA**: Orumana VII. **SWAn**: Ruacana Falls, Kunene R, Ovamboland, V.

In Scottsville the habitat is degraded thornveld, and there is no record in the NM from the wetter, wooded, western side of Pietermaritzburg (Town Bush, Wintersk1oof or Blackridge). At the Nagel Dam, a hot dry area, it was in valley bushveld. In South Africa this appears to be a bushveld species.

H. zuluensis Oldroyd 1952

H: Sycamore; Machadodorp XII; Kalkoenkrans, Carolina Dist. **E**: Hlabisa Game Reserve VII, 1911, type locality, (now the 'game corridor' between Hluhluwe and Umfolosi Reserves).

SYNOPSIS OF SPECIES DISTRIBUTION

The data on the distribution of species given above in the checklist are summarized in the following tables. Seven species for which no precise localities are known, have been omitted, namely: *Philoliche* (*Phara*) *chrysostigma*, *Philoliche* (*Buplex*) *brachyrhyncha*, *Chrysops ciliaris*, *Mesomyia* (*Pronopes*) *nigricans*, *Limata laevifrons*, *Tabanus brunneus* and *Haematopota scutellaris*. A further species, *Haematopota recurrens*, is also omitted because of its probable synonymy with *imbrium*.

TABLE 1—Genus *Stuckenbergina*

Species	M	W	K	A	SWAn	SWAs	SS	SN	SE	E	D	H	L	NT	B	Non-Endemic
africana	×															
callani				×												

TABLE 2—Genus *Philoliche*

Species	M	W	K	A	SWAn	SWAs	SS	SN	SE	E	D	H	L	NT	B	Non-Endemic
Subgenus *Buplex*																
basalis		×														
brincki	×															
dissimilis		×														
fuscinervis									×							
leucomelas	×			×												
praeterita	×															
suavis			×						×			×	×	×		
subfascia										×			×			
Subgenus *Dorcaloemus*																
silverlocki										×				×		×
Subgenus *Maverica*																
ingrata	×		×													
spiloptera	×	×	×													
Subgenus *Ommatiosteres*																
angulata	×	×	×	×												
atricornis		×		×					×		×					
caffra	×					×	×	×				×				
lateralis	×	×	×	×												
marriotti											×					
nitida				×												
Subgenus *Phara*																
andrenoides											×					
bivirgulata										×	×					
crassipalpis				×												
flavipes				×												
fuscanipennis	×															
melanopyga							×					×		×		
nobilis				×			×				×			×		
oreophila											×					
quinquemaculata									×	×	×			×		
rubramarginata	×	×	×	×						×	×			×		×
tertiomaculata													×			
tumidifacies			×													
turpis				×												
Subgenus *Philoliche*																
aethiopica		×	×	×			×		×	×	×	×	×	×		×
elegans		×	×	×												
formosa							×			×			×			
gulosa	×	×	×	× ?												
rostrata	×	×	×													
Subgenus *Returneria*																
adjuncta	×		×			×										
alternans	×	×		×												
Subgenus *Stenophara*																
ovambo					×											
zonata															×	×

TABLE 3—Genus *Adersia*

Species	M	W	K	A	SWAn	SWAs	SS	SN	SE	E	D	H	L	NT	B	Non-Endemic
ambigua				×												
callani				×					×	×						×
oestroides				×					×	×						×

TABLE 4—Genus *Braunsiomyia*

Species	M	W	K	A	SWAn	SWAs	SS	SN	SE	E	D	H	L	NT	B	Non-Endemic
cinerea		×		×						×						×

TABLE 5—Genus *Chrysops*

Group Species	M	W	K	A	SWAn	SWAs	SS	SN	SE	E	D	H	L	NT	B	Non-Endemic
ciliaris																
fuscipennis										×				×		×
laticeps										×						×
distinctipennis																
obliquifasciata				×			×	×		×	×	×	×	×		×
laniger																
inflaticornis									×							
laniger				×							×					×
longicornis																
longicornis									×	×						
woodi																
calida				×												

TABLE 6—Genus *Hinea*

Species	M	W	K	A	SWAn	SWAs	SS	SN	SE	E	D	H	L	NT	B	Non-Endemic
fallax										×						×
lugubris													×			×
pertusa					×					×					×	×

TABLE 7—Genus *Sphecodemyia*

Species	M	W	K	A	SWAn	SWAs	SS	SN	SE	E	D	H	L	NT	B	Non-Endemic
lamborni										×						×
natalensis										×						

TABLE 8—Genus *Tabanocella*

Species	M	W	K	A	SWAn	SWAs	SS	SN	SE	E	D	H	L	NT	B	Non-Endemic
bilineata											×					
denticornis				×					×	×	×	×	×			×
immaculata									×							
schofieldi										×						
zoulouensis										×	×		×			×

TABLE 9—Genus *Thriambeutes*

Species	M	W	K	A	SWAn	SWAs	SS	SN	SE	E	D	H	L	NT	B	Non-Endemic
v-album													×			×

TABLE 10—Genus *Erodiorhynchus*

Species	M	W	K	A	SWAn	SWAs	SS	SN	SE	E	D	H	L	NT	B	Non-Endemic
edentula	×	×	×													
obtundata	×															
pusillus		×														

TABLE 11 — Genus *Mesomyia*

Species	M	W	K	A	SWAn	SWAs	SS	SN	SE	E	D	H	L	NT	B	Non-Endemic
Subgenus *Pronopes*																
constrictifrons	×															
flavipes			×	×												
Subgenus *Perisilvius*																
anomalus										×						
algoensis				×												
argenteus									×							
barnardi			×													
callosus										×						
confluens										×						
contrarius							×				×					
coriarius	×															
cuneatus										×						
designatus	×															
divergens										×						
marieps													×			
mossambicensis										×						×
provincialis	×															
redundus		×														
tinleyi										×						
Subgenus *Mesomyia*																
aurantiaca	×															
costata	×	×	×				×					×				
decora					×	×		×		×				×	×	×
hirsuta	×															
namaquina		×														
Subgenus *Bacloceras*																
turneri											×					

TABLE 12 — Genus *Amanella*

Species	M	W	K	A	SWAn	SWAs	SS	SN	SE	E	D	H	L	NT	B	Non-Endemic
angusta				×												
atra	×															
emergens				×												
furcata	×															
ignota													×			
ingridinia										×						
medialis										×	×		×			
minor	×															
nana				×												
pondo									×							
sulcipalpus				×												
shaka											×					
zimbiti											×					

TABLE 13 — Genus *Limata*

Species	M	W	K	A	SWAn	SWAs	SS	SN	SE	E	D	H	L	NT	B	Non-Endemic
bedfordi										×						
capensis	×	×	×	×												
facialis	×															
kuhnelti						×										
miranda											×					
parafacialis				×												
tenuicornis	×	×	×													

TABLE 14 — Genus *Neavella*

Species	M	W	K	A	SWAn	SWAs	SS	SN	SE	E	D	H	L	NT	B	Non-Endemic
producticornis				×												×

TABLE 15—Genus *Atylotus*

Species	M	W	K	A	SWAn	SWAs	SS	SN	SE	E	D	H	L	NT	B	Non-Endemic
agrestis					×				×	×				×		×
diurnus	×															
fulvianus								×								
fuscipes									×	×	×		×			×
nigromaculatus								×			×	×		×		

TABLE 16—Genus *Ancala*

Species	M	W	K	A	SWAn	SWAs	SS	SN	SE	E	D	H	L	NT	B	Non-Endemic
africana					×					×						×

TABLE 17—Genus *Euancala*

Species	M	W	K	A	SWAn	SWAs	SS	SN	SE	E	D	H	L	NT	B	Non-Endemic
maculatissima				×					×	×	×		×			×

TABLE 18—Genus *Tabanus*

Group Species	M	W	K	A	SWAn	SWAs	SS	SN	SE	E	D	H	L	NT	B	Non-Endemic
chevalieri																
chevalieri	×	×		×						×	×			×		×
saxicolus											×					
vexans	×			×												
sufis																
gratus						×				×	×		×	×		×
impertinens		×	×													
leucostomus	×	×	×	×	×	×	×			×	×				×	×
minuscularius										×	×		×	×		×
obliquemaculatus			×		×											
pertinens	×									× ?						
taeniatus	×		×	×			×		×		×	×				
insignis																
atrimanus				×					×	×		×	×	×		×
insignis										×	×	×	×	×		×
variabilis										×	×					×
pullulus																
copemani													×		×	×
pullulus													×			×
ruficrus																
biguttatus	×			×					×	×	×			×		×
corax								×			×	×				
plain																
par				×					×	×						×
thoracinus														×		×
zoulouensis										×						×
patterned																
albilinea	×						×		×		×					
barclayi										×			×	×		×
denshamii										×						×
fraternus										×						×
laverani										×						×
nyasae										×						×
sericiventris												×		×	×	
taeniola	× ?								×	×	×	×		×		×
ustus										×						×

TABLE 19—Genus *Haematopota*

Group Species	M	W	K	A	SWAn	SWAs	SS	SN	SE	E	D	H	L	NT	B	Non-Endemic
bullatifrons																
daveyi										×					×	×
distincta																
imbrium				×				×	×	×	×	×	×			×
hirta																
montisdraconis											×	×				
quathlambia											×					
mordens																
circumscripta												×		×		×
pardalina										×						×
transvaalensis														×		
tumidicornis																
bedfordi												×				
bistrigata										×	×	×				
infernalis	×					×										
mephista											×					
megaera				×												
ocellata	×	×	×	×			×	×	×	×	×	×				
ovazzai							×									
rubidicornis										×						
theobaldi											×	×	×	×		
vittata																
albihirta									×	×	×		×	×		×
bipunctata	×						×			×		×				
decora					×					×	×				×	×
duplicata									×							
vittata					×					×	×		×			×
zuluensis										×		×				

COMMENTARY ON THE SOUTH AFRICAN TABANID FAUNA

Subfamily Pangoniinae

Tribe Pangoniini (one genus, two species).

The only recorded Ethiopian Region genus, *Stuckenbergina*, has two known species, one montane and one silvicolous, each known only from its type locality in the Cape Province and both caught only once. This may be a case of true rarity, or perhaps specialized requirements make the species difficult to discover and others are living undetected in inaccessible mountain regions.

Tribe Philolichiini (one genus, eight subgenera, 41 species).

The genus *Philoliche* is widespread throughout the Ethiopian Region, but the subgenera show varying amounts of localization.

1. *Buplex* (nine species) is a South African group with the exception of the Central African *malindensis* Oldroyd. The South African species are all endemic with the possible exception of *subfascia* which T. Dias (1966) records from the Lourenço Marques district of Moçambique but which has not been seen by himself. Some of the species are montane, others are silvicolous, and a few are both; several have been recorded only once. The strikingly coloured *suavis* is the most widespread species, obviously less restricted in habitat than the other members. From the locality labels I deduce this to be a savannah and tree-savannah species, and thus would expect it to spread into the adjacent areas of Moçambique and

lowland Rhodesia, but there are no such records. Because *subfascia* is so widespread in Zululand, and is also found in the lowveld, it may extend along the Lebombo Mountains into Moçambique. This species was attracted to a car out of dense bush, and is listed from the Gwalaweni Forest as well as out of tree-savannah.

It is unusual that the Hottentots-Holland Mountains should have two species, *leucomelas* and *praeterita*, but these are not at all alike; according to Oldroyd (1957: 401) the latter, although deceptively like *atricornis*, is closely allied to *brachyrhyncha*. He also compares *dissimilis* with *brachyrhyncha*, which two, as well as *praeterita*, are rare. Apparently *fuscinervis* and *brincki* are similar in appearance to *suavis*, but the former has distinctively infuscated wings. The last, *basalis*, looks like a black-and-white *O. angulata*, but has the group characters of *Buplex*. The rare members of this group are absent from the NM and I have relied on Oldroyd's data. The greatest concentration of *Buplex* species is along the east coast, *suavis* being an exception.

2. *Dorcaloemus* (one species) is a compact group of closely allied species, mainly in Central and East Africa, of which only *silverlocki* is known from South Africa (NT and E). This species must also be present in the lowveld. The presence of *fodiens* Austen and *compactus* in any or all of B, NT and L would not be surprising, since Goodier (1967) records them from adjacent areas in Rhodesia.

3. *Maverica* contains two closely allied species endemic to the S.W. Cape, and a third from the Congo. Both South African species are from winter-rainfall areas, but *ingrata* has been found in areas for the most part drier than the localities of *spiloptera*. The group relationships are uncertain (Oldroyd, 1957: 406). *M. ingrata* shows some characteristics of the *Phara* group, convergence with *Erodiorhynchus edentula* and a macroscopic resemblance to *P.* (*Philoliche*) *gulosa*. The hairy, bee-like *spiloptera* with clouded patches near the wing tips is a most remarkable fly.

4. *Ommatiosteres* (six species) has a group in the western and southern Cape, spreading east and north east into Natal, and, separated by a huge distance, equatorial western and eastern groups. The South African group is small with few species. In the south-west Cape is the extraordinarily complex *angulata* group of colour forms, and, with the same wing venation, *nitida* from the eastern Cape, *marriotti* from the Natal Drakensberg (both apparently localized, montane species) and the widespread, open-country *caffra*. The bright wing colour of *nitida* seems to link it with the northern species, *lautissima* (Austen) and *elongata* (Ricardo); *marriotti* looks much like *caffra* but has a partially shining face, thus showing kinship with the *Phara* group. The rotund, bee-like, open country *atricornis* is widespread, and with *lateralis* seems to have little connection with the other species. However, a series of specimens of *atricornis* from Stellenbosch vary in shape surprisingly from typically rotund to elongate like *marriotti* (Usher, 1967: 596).

5. *Phara* has a large number of species (15) in South Africa; the subgenus spreads from the south-west Cape along the east of the continent, and northwards well past the equator. The only non-endemic species is *rubramarginata*, known from the south-west Cape to Malawi, a very peculiar species which is closely allied to the highland and montane species *melanopyga*, and which has much in common with *crassipalpis*. The atypical shape of the face and thin proboscis separate *tumidifacies* from all others. Like *O. marriotti*, *flavipes*

does not entirely fit the group characteristics, all other species being robust, shiny, black flies, often having white or brassy hairs and coloured wings. Both *bivirgulata* and *quinquemaculata* are similar, silvicolous species occurring together in some forests in D; *turpis* is also from a forest in the eastern Cape Province. Both *andrenoides* and *oreophila* are from the Natal Drakensberg, the former from open grassland; the latter was caught in a house. However whereas *andrenoides* looks a typical *Phara*, *oreophila* shows some affinities with *M. spiloptera*, including a cloud at the wing tip. Oldroyd (1957: 410) maintains that *M. ingrata* is intermediate between *Phara* and *Maverica*.

6. *Philoliche* s.str. is widely spread north of South Africa but within this region has only five species. Three of these are probably the most spectacular South African pangonines, the long-snouted, colourful *gulosa*, *aethiopica* and *rostrata*, the last two of which are also unusually large. The only non-endemic, *aethiopica*, is incredibly variable and closely related (or synonomous with) the problematical *formosa*, as well as the more restricted *elegans*. None of these species is rare; *gulosa* and *rostrata* are both well known and are from the winter-rainfall area, but *gulosa* extends further into the dry north-west Cape than does *rostrata*. They are recorded from plains and mountains with macchia vegetation; there is no information of either from forest. The remaining trio would appear from the labels to be grassland-savannah or tree-savannah species. Observations and records of *aethiopica* from Natal have all been from open country or grasslands within reach of forest or gallery forest or bush. Occasionally they are found within forest margins or in clearings.

7. *Stenophara* is a widespread, predominantly tropical and equatorial group. There is a single endemic, *ovambo*, known on the unique holotype only, and according to Oldroyd (1957: 537), related to the Central East African *distincta*. There is a single incursion from the north, *zonata*, which is known from Botswana, from where it extends northwards up East Africa to the Red Sea, a widespread savannah species. It would not be surprising to find *bubsequa* (Austen) in B also, and both of them in NT.

8. *Returneria* is a strange little endemic subgenus, allied to *Buplex* on account of the presence of ocelli, but the males are not holoptic. All records but one (Ceres) of *alternans* are from coastal regions, widely spread from Cape Agulhas to Port Elizabeth, while the dusty-looking *ingrata* is from drier inland areas.

Subfamily Scepsidinae

Tribe Scepsidini (two genera, four species).

These are sandy-grey beach tabanids. *Adersia oestroides* is widespread along the east coast from the eastern Cape to the equator. *A. callani* is not recorded north of Beira, otherwise its distribution is the same except that, on the Natal coast, in summer *oestroides* is found and in winter *callani*, a seasonal replacement not followed in Moçambique or the eastern Cape Province. *A. ambigua* is possibly the female of *callani*; it is significant that no females of *callani* have been found, nor any males of *ambigua* although both occur in the same area.

Braunsiomyia cinerea has the same distribution as *A. callani* but is known from the west coast also. This is remarkable on account of the long stretches of unsuitable, rocky shore on the southern Cape coast, for example Plettenberg Bay to Cape St Francis, and west of Hermanus. The dark banding of the abdomen of *cinerea* is markedly more extensive in specimens from Moçambique. Natal specimens are also banded to varying degrees, whereas Cape specimens are mostly grey.

Subfamily Chrysopsinae

Tribe Chrysopsini (one genus, nine species).

All the South African species of *Chrysops* are members of widely spread northern groups. There are two endemics only. The rare *calida*, a far south, isolated member of the Central African—Malagasy *woodi* group, which is known from around Grahamstown. The unique *inflaticornis*, a member of the *laniger* group, is known only from King William's Town, and has not been seen since capture at least 60 years ago. In the NM there is no South African specimen of *ciliaris* which is recorded from Wahlberg's 'Kaffraria'. As Goodier lists this species from Rhodesian areas adjacent to NT and B, presumably Wahlberg caught the fly during his travels (see fig. 2) in the north of the territory. The closely related *laticeps* and *fuscipennis* are very widespread eastern species with a similar distribution but the former is better known in Zululand and does not extend so far north. The other species, *laniger*, *obliquefasciata* and *longicornis*, are all widespread species with a wide ecological tolerance, but only *laniger* is a truly forest species in South Africa.

South African members of this tribe are few, and none are recorded from the south-west Cape.

Tribe Rhinomyzini (four genera, 12 species).

Hinea pertusa, the type-species of the genus, is a strikingly effective blue-black and orange wasp-mimic. This colouring immediately separates it from the sombre *lugubris* and *fallax*. All three appear to have a wide ecological tolerance; *pertusa* in particular is known from Zululand, Botswana and South West Africa (Etosha) to Tanganyika and Congo Zaire. The small, brown *fallax*, peculiar in that the dorsal hook of its third antennal segment is short instead of long as in other species, is well known in lowland Natal and Zululand but surprisingly absent from the Transvaal lowveld. The much larger *lugubris* is known almost entirely from Rhodesia, where it has been taken at bait cattle which is interesting as I could find no reference to the hosts of the other two species. Although *lugubris* is known only from L, the absence from NT and B may be a collecting gap; Goodier (1966, 1967) lists it from adjacent areas in Rhodesia.

Sphecodemyia is a mysterious tree-top genus of which Oldroyd (1957: 131) says the most likely habitat will be forest canopy, 'since even in savannah country they are not normally seen within several feet of the ground'. In the light of his remarks it is very interesting that *lamborni*, collected in Malawi, should be caught in Ndumu, Zululand, and *natalensis*, collected many years ago in the now urbanized Greenwood Park, Durban, should be found in forest at Eshowe, Zululand. Both are evidence of spectacular collecting gaps and the necessity of specialized collecting methods to discover the true distribution. The other three members of the genus seem to be also rare, their localities widely separated north of South Africa.

Thriambeutes v-album is distributed in Malawi, Moçambique and Rhodesia, and has been recorded from the Transvaal lowveld. The larvae have been bred out from *Sterculia* trees (Oldroyd, 1957: 148) so presumably it is also a rothole species which must be associated with forest or woodland. Two of the three remaining species of the genus are from equatorial forest canopy, so specialized collecting techniques may well be rewarding in this genus also.

The South African species of *Tabanocella* are all associated with thick bush, woodland or forest; *bilineata*, *immaculata* and *schofieldi* are endemics, while *zoulouensis* is recorded from the forests in the east of Rhodesia, and *denticornis* is more widely distributed both in Rhodesia and South Africa. Both *zoulouensis* and *denticornis* are known to come to light and both fly in the dusk (*denticornis* bites in almost total darkness, and frequently at dusk) but both are also known to fly in broad daylight. In the wooded areas around Pietermaritzburg where *denticornis* is very common it can be seen pestering cattle on brilliantly sunny, hot days, as well as on overcast days. It also flies to cars in great numbers and can be caught in a Harris Fly Trap. The greatest number of species of this genus is known from Madagascar. Some northern members of the genus are from savannahs, and some are thought to be completely crepuscular in habits.

Obviously there is a great deal to learn about this tribe, the members of which are often bizarre in appearance. Many fill ecological niches which do not contact us or our domestic animals, and so they have received little attention. Some species are known to bite large mammals (several *Tabanocella* species as well as *Hinea lugubris*) but the hosts of others are a mystery. Specialized methods of collecting and study would be most rewarding as these are unusual and very interesting, poorly known tabanids.

Tribe Bouvieromyiini (two genera, 28 species)

The large genus *Aegophagamyia*, predominently from Malagasy, is unknown in South Africa, although T. S. Dias (1966) records *austeni* Oldroyd from the Inhambane district in Moçambique. *A. pungens* Austen, a littoral species, is known on the mainland (Mombasa), Zanzibar and Pemba, and on Malagasy; with such a wide distribution, it is perhaps surprising there is no record in South Africa.

Erodiorhynchus has only three known species, all endemic to the southern and western Cape. The well known, small, bee-like *edentula* is recorded from a variety of localities in M, K and W, and despite being often found on flowers and coated with pollen, possesses well-developed mandibles (Oldroyd, 1957: 258). The proboscis gives this species the appearance of a small pangonine. The remaining two species are rarities; *obtundata* is a montane species, and *pusillus* is known from near the Atlantic coast.

The genus *Mesomyia* has five subgenera in South Africa; the sixth Ethiopian region subgenus, *Dasycompsa*, is wholly absent. Subgenus *Bacloceras* has a unique South African endemic species (D: Van Reenen's Pass); the only other species is from Madagascar, but the status of the subgenus as well as the relationship of the species is in doubt which only more material can elucidate.

The Ethiopian region members of *Mesomyia* s. str. are endemic to South Africa, with the exception of the widespread *decora* which extends into Rhodesia, and its subspecies *schoutedoni* which occurs in and to the north of Rhodesia. This is an open-country species known from a wide range of localities (SWAn, SWAs, SN, B, NT and E). Another widespread, but endemic, species is *costata* from M, W, K, SS and H, which bears no microscopic resemblance to *decora* and is often pollen-coated. It is mainly a western and central species; the record H is from the western Orange Free State in the flat savannah around the Vaal River, and Cradock (SS) is also non-montane with karoo vegetation. More limited and uncommon are the montane *aurantiaca* and *hirsuta*, and the desert species *namaquina*.

Perisilvius is a very considerable subgenus with a few northern species, 15 endemic South African species and one non-endemic. Strangely, only one endemic is recorded from more than one climatic zone, namely *contrarius*, which is known from the Katberg (SS) and Lundean's Nek, Barkly East district (D). As explained above, the Katberg has close affinities with the southern Drakensberg and should really be classified in D but unfortunately falls too far within the boundaries of SS. The other species seem very limited in distribution, most being montane or silvicolous or both; many were collected long ago and biological details are rare. In the south the montane species are *redundus* (Bosjesmansberg), *barnardi* (Seven Weeks Poort), *coriarius* (Kirstenbosch), *contrarius* (Katberg, Lundean's Nek and Naude's Nek), *provincialis* and *designatus* (both from several mountains in M). All are without further details except *contrarius* which is known from alpine grassland. Species not montane, *cuneatus*, *confluens*, *callosus* and *mossambicensis*, are all from E; the first three are recorded from an area subsequently subject to urban and industrial development. Further north the closely related *tinleyi* and *marieps* are both montane, the former from the Gwalaweni Forest on Lebombo Mountain, Zululand, and the latter from the Marieps Mountain on the eastern Transvaal escarpment (an area with forest, so that, although without biological data, the species may well be silvicolous also).

Oldroyd (1957) mentions that *designatus* is closely allied to *callosus*, *redundus* looks very like *mossambicensis*, *cuneatus* like *contrarius*, and *provincialis* like *barnardi*; while *anomala* and *algoensis* are unlike each other or the other species. He also says that *divergens* is close to *monticola* Neave (with which he also compares *mossambicensis*). The female of *argenteus* is very like that of *monticola*, as are the males, with a similar type of sexual dimorphism. This makes an interesting pattern: *argenteus* from SE, *divergens* from Durban and the Zululand plain (E), *monticola* in Malawi, and to the north two closely related species, *nyassicus* Enderlein and *stannusi* Oldroyd, both in Tanzania.

Subfamily Tabaninae

Tribe Diachlorini (three genera, 22 species)

Mackerras (1964) synonymized *Amanella* with *Cydistomyia* Taylor. Later, however, I decided (Usher, 1965) to retain *Amanella* as a subgenus for purely African *Cydistomyia* species although the status of the related genera was in doubt. As Mackerras (*in litt.*) is reviewing the status of the African genera of Diachlorini and the whole question is *sub judice*, I have decided to revert to Oldroyd's (1954) classification for the purpose of the present paper.

Genus *Neavella* is represented in South Africa only by *producticornis*, a coastal species found once in the eastern Cape at Kasouga, with no intermediate locality recorded between there and southern Moçambique. Two more species are known, both coastal, and one, *albipectus* Bigot, occurs on the mainland (Kenya), Zanzibar, Malagasy and intervening islands. This species is closely allied to *producticornis*, and both are widespread as well as being from widely separated localities. Nevertheless there is probably a collecting gap along the South African coast.

The genus *Limata* is endemic to South Africa, and is a curiously sparse group. The only known species in Zululand is *bedfordi*. In D, widely distributed apparently along the Drakensberg foothills and Hogsback in montane forest, is *miranda*, while *kuhnelti* is limited to the Namib desert where it is common on the dunes around Gobabeb. The remaining species are from the Cape. Extending from M into the Karoo and Namaqualand, *tenuicornis* s. str. is replaced in dry areas by its dusty-grey subspecies *karooensis* which is somewhat similar to the whitish deserticolous *kuhnelti*. A rare, montane species from the Cape Peninsula, *facialis*, is related to *parafacialis* from Sheldon and Grahamstown, according to Oldroyd (1957: 469) who suggests it may merely be an eastern subspecies although it is not montane. The only really widespread, well-recorded species is *capensis*, a robust, noisy, numerous, attentive species not easily overlooked in the field, which is quite unlike the furtive *miranda* and *tenuicornis*. Although it is not known from very dry regions, *capensis* is recorded from winter- and all-year-round rainfall areas. The most striking feature about *miranda* besides its elusiveness is the appearance of a melanic form in the middle of its poorly known distribution range.

Amanella is largely a southern genus with a northern extension. It can be divided into three groups: (1) a north-eastern savannah group, comprising *amblychroma* Speiser from East Africa, *grayi* Oldroyd from Malawi, and *imbecilla* Karsch from Moçambique and Rhodesia. In the Natal Museum are several male specimens from the Barberton area, Marieps Mountain (both in L) and the Zoutpansberg Range (NT) which are closely similar to *imbecilla*. (2) A silvicolous group, mainly distributed in the forests of the Natal Midlands, namely *medialis*, *ingridina* and *zimbiti*, with *cooksoni* (a dark species like *medialis*) on the Vumba Mountain in eastern Rhodesia. In the south, *pondo*, at Port St Johns, has yellow-brown colouring like *ingridina* and *zimbiti*. (3) A group from the western Cape Province, mostly montane, all with grooved palpi (Oldroyd's subgenus *Canalicula*, 1954: 81); also in this group, but in the eastern Cape, is *sulcipalpus* which forms a link in colouring and appearance with the species in the second group. The remaining two species, *shaka* from the Natal Midlands and *emergens* from the eastern Cape Province, fit in none of these groups, but in size and appearance are most like species in group 1.

Tribe Tabanini (five genera, 37 species).

Ancala africana is the only member of the genus to reach South Africa, and it does so at the southern tip of a very wide distribution. It is one of a closely related group of large, orange-brown tabanids with banded wings, well-known in tropical and equatorial Africa. They are common around cattle in lowland areas near water, and have been observed pestering game animals in Zululand by Mr Tinley. No doubt their size, spectacular colour and appetite for mammalian blood explain their prevalence in collections.

The genus *Euancala* is monotypic, but its very widespread species *maculatissima* has an equatorial subspecies *irrorata*. This fly must surely be one of the most improbable tabanids, with its hemispherical head, bright colouring and countless spots on eyes, wings, thorax and abdomen. It is known from further south (Kleinemond in A) than *Ancala africana*, but otherwise their distribution is not very different.

Atylotus is a widespread, non-endemic genus, very different in appearance from the previous genera. Endemic species are *diurnus* with its unique holotype from the Cape of Good Hope, and *nigromaculatus* which is fairly widespread in South Africa. Both these are closely related to the non-endemic species, *fuscipes* and *agrestis*; I do not know *fulvianus* and *diurnus*, but *fuscipes*, *agrestis* and *nigromaculatus* are savannah species. At Onderstepoort in the Transvaal *agrestis* and *nigromaculatus* are sympatric, and in northern Natal, *fuscipes* and *nigromaculatus* have been taken in the same pasture. Although there are very many *agrestis* at Ndumu in Zululand, I cannot recall being bitten there by one, nor is there any label on a Natal Museum specimen recording biting habits. A very widespread species, *agrestis* is recorded from as far afield as the Palaearctic Region.

Tabanus is a very widespread genus which, like *Atylotus* and *Haematopota*, is not limited to Africa. In many ways the representation of this genus in South Africa is the reverse of the situation of the genus *Philoliche*: firstly there are few endemics; secondly most species are from savannah or at least open country; and thirdly, they are well-known for their biting habits and orientation to the distribution of large mammals. Conversely, many *Philoliche* species are montane or silvicolous, records are often few and their distribution limited or poorly known.

Because the status in the Ethiopian Region of the subgenus *Hybomitra* is in some doubt (Oldroyd 1954: 131–133), I have listed the implicated species in the '*chevalieri*' group only. This group is widespread, extending from the Cape up the eastern part of the continent, avoiding the dry regions, and across the equatorial zone. Most of the species are closely related to *chevalieri* which itself is found throughout most of the region just mentioned. In South Africa the very variable *chevalieri* is known from many habitats in many areas, excluding the dry western and central zones. The closely related *saxicolus* may prove to be only a synonym of *chevalieri*, but it has been found only in montane grassland areas beside streams, and its flight period seems to be very limited. Less similar but still obviously related is *vexans*, which, from the localities recorded, would appear to be spread along the mountain ranges of the southern end of the continent.

The *sufis* group is a large one, widely spread in the Ethiopian Region. Within South Africa the only widely distributed endemic is *taeniatus*, a strikingly black-and-white fly like the non-endemic *gratus*, but the former is unique in shape and pattern. The dry-country endemic, *obliquemaculatus*, is closely related to the widespread, well-known non-endemic *leucostomus* which is known from a variety of habitats ranging from desert areas to well-watered woodland. Another widespread non-endemic, *pertinens* known from M and E to the equatorial regions, has a dry-country endemic relative, *impertinens*, from the Cape. Finally, *minuscularius* is small and inconspicuous but well known, and extends from D through the eastern part of the region into the Moçambique plains.

The *insignis* group is also widespread in the equatorial regions, with a related trio of species extending down the eastern side of the continent into South Africa. Both *atrimanus* and *variabilis* are well known, bite humans, and are closely similar in appearance and distribution. I have seen no South African record of the handsome *insignis* from forest, although it is common in woodland, but Cookson (1954: 101) collected a long series in montane areas, and Oldroyd records Potts as saying 'Like *atrimanus*, associated with running water in cooler hill country'.

The *pullulus* group is very small with four known species on the east of the continent and one on the west. The eastern four are predominantly in Rhodesia and Malawi, and of these *pullulus* and *copemani*, both savannah species, are known from regions of South Africa adjacent to Rhodesia and may prove to be more prevalent with further collecting.

The *ruficrus* group is represented by only two species. The common non-endemic *biguttatus* is known throughout most of the savannahs of the Ethiopian Region but avoids very dry regions. It is not recorded in L which must surely be a collecting gap. The closely related endemic, *corax*, is known from the highland areas from which there is no record of *biguttatus*. Other species of the group are almost entirely equatorial.

The *plain* group, with many species, is also predominantly tropical. Only three species range down the east side of the continent into South Africa; *par* extends as far as A and is mostly coastal; *thoracinus* is known from NT; and *zoulouensis* from E, but both probably occur in L. There is one problematical species, *brunneus*, which may be an endemic or a synonym of *zoulouensis*.

The *patterned* group has nine species recorded from South Africa most of which are widespread north of the territory and extend across its border only in the southern extremity of their ranges, except *taeniola* which is certainly known as far south as Kentani near East London. There are two endemic species, *albilinea* which is recorded along the east coast and foothills of the Drakensberg to northern Natal, and *sericiventris* known from the interior highland areas.

Tribe Haematopotini (one genus, 25 species)

The large, complex genus *Haematopota* dominates this tribe in the Ethiopian Region and is the only known genus in South Africa, *Hippocentrum* being entirely absent. Oldroyd divided the Ethiopian Region species into 12 groups. Seven of these have representatives in South Africa.

The *bullatifrons* group is a small, equatorial and mainly silvicolous group from the west of the continent. The species *daveyi* is well known from Malawi and Rhodesia. It has also been recorded in Botswana, and may be present in the lowveld. This is obviously not a forest species, as Goodier records it from the Nuanetsi District, an arid area with mopane woodland, adjacent to the South African border.

The East African-centred *distincta* group has two South African species, *imbrium*, widely spread from Kenya to the eastern Cape, and *recurrens* of Natal, which is probably a synonym. In Natal and Grahamstown *imbrium* is recorded from October to May; in D (Town Bush, Pietermaritzburg) the main emergence is usually from November to January. Although caught in forest glades, it is most often seen pestering cattle in pastures or open woodland, and there is no record from well inside forest.

Two representatives of the *mordens* group, *circumscripta* and *pardalina*, are closely related; the former is from the Transvaal highveld and the adjoining highlands in southern Rhodesia, while the latter occurs in the Moçambique plain, lowland Rhodesia and Zululand plain (no doubt also the Transvaal lowveld). The third South African member, *transvaalensis*, is related to *maculosifacies* of Moçambique (also doubtfully recorded from Stellenbosch), and has been recorded only from Onderstepoort. The highland *circumscripta* has later dates on the labels than either *pardalina* or *transvaalensis*.

The *vitatta* group is widely spread in subsaharan Africa, as are also the three non-endemic species occurring in South Africa. *H. decora* is known throughout the Ethiopian Region, extending into Natal, South West Africa (the northern bushveld area in the Caprivi Strip, not the desert) and Botswana; *vitatta* occurs in East Africa and is also in Natal and northern South West Africa (probably it is also in Botswana); *albihirta* is a very well known species of the eastern savannahs, found as far south as Port St Johns. There are three endemic species: *zuluensis*, a species with limited range, links *vitatta* and *albihirta* (very different species) with *bipunctata* and *duplicata*. *H. bipunctata* is the better known of the last pair and seems to be the highland counterpart of *duplicata* which is known from the coast. Both these last species have doubled wing rosettes, and are peculiar looking endemics.

The *hirta* group has two South African species and three in central Africa, a wide separation. Both *quathlambia* and *montisdraconis* are montane, from D and H, and have many characteristics in common with the *tumidicornis* group. The possession of *hirta* features may be due to convergence rather than relationship.

The *tumidicornis* group is the only one with a subgroup endemic to South Africa; it has a second centre of endemism in East Africa, separated by Rhodesia and northern Moçambique. Except for three species recorded in Moçambique by T. Dias (1966), the southern group is limited to South Africa with all known species endemic to the territory, dominated by the ubiquitous, problematic species *ocellata*. In the Cape Province *ocellata* is recorded from pastures, macchia and open parkland. In Natal records are predominantly from forest; there are a few exceptions, Mr Oatley having found the species in grassland (Underberg district), in pasture (Cedara) and in degraded thornveld (Muden). Of the remainder, *mephista*, *megaera* and *bistrigata* are closely related but do seem to be distinct from *ocellata*. From Zululand *rubidicornis* is recorded, a rather different, more northern offshoot. Being a rather faded male, the holotype of *ovazzi* remains an enigma.

DISCUSSION

1. The distribution of the species (table 20):

a. The number of species from a region (fig. 3) is not related to the size of the region, and the highest totals are from the four smallest regions, E (64), D (45), A (42), M (40). However, it must be borne in mind that there is a museum in each of E, D and M which has had staff orientated to the capture of these flies for many years. For historic reasons the early collectors most often visited localities which were easily reached and consequently there is a bias in favour of the coastal regions and trade routes in collections before 1900. Some species, collected by early travellers and even by entomologists earlier in this century, have not been seen since and may be extinct due to habitat destruction.

b. Conversely, the very large areas of SWAs, SWAn and B are poorly represented in the tables. Most of these areas are arid or even desertic, and large parts are topographically undifferentiated. They are also regions with a low human population density, inhospitable climatically and relatively poor in communications, and so are less likely to be visited by casual collectors, although hardy specialists have found expeditions rewarding.

In Rhodesia systematic collections of tabanids made during tsetse fly rounds have greatly supplemented incidental captures. From the western and southern regions Goodier (1967) has listed species not recorded in the adjacent areas of NT, B and L. As there is no

TABLE 20—Size and endemism of regional Tabanid faunas

	M	W	K	A	SWAn	SWAs	SS	SN	SE	E	D	H	L	NT	B
(*a*) Total number of species per region	40	24	23	42	9	7	14	8	26	64	45	23	26	26	8
Percentage of total	24	14	14	25	5	4	8	5	15	38	27	14	15	15	5
(*b*) Number of species endemic to South Africa, per region . .	36	19	20	26	3	3	11	5	12	20	26	15	8	8	1
Percentage of regional total which are South African endemic species $= \frac{b}{a} \times 100$	90	79	87	62	33	43	79	63	46	31	58	65	31	31	13
Percentage of total endemic species $= \frac{b}{123} \times 100$	29	15	16	21	2	2	9	4	10	16	21	12	6	6	0,8
(*c*) Number of species endemic to one region only	16	5	2	13	1	1	1	1	6	12	11	1	3	1	0
Percentage of all endemic species per region $= \frac{c}{b} \times 100$ . . .	44	26	10	50	33	33	10	20	46	57	41	7	33	11	0
(*d*) Number of species not endemic to South Africa, per region . .	4	5	3	16	6	4	3	3	13	43	18	8	17	17	7
Percentage of regional total $= \frac{d}{a} \times 100$	10	21	13	38	67	57	21	37	50	67	40	35	65	65	87

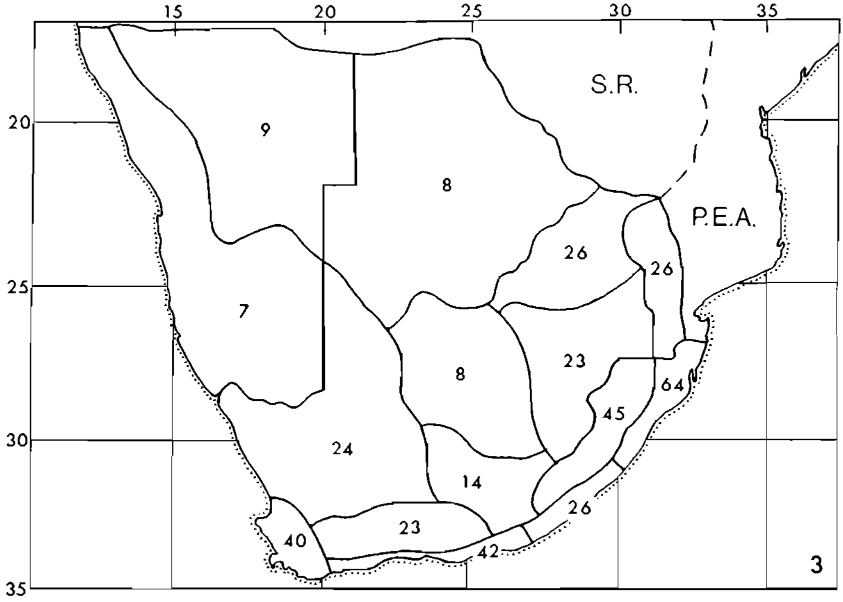

Fig. 3. Map showing the total number of tabanid species in each region.

ecological discontinuity between Rhodesia and South Africa in the areas mentioned, the apparent absence of some Rhodesian species is probably due to a lack of collecting. A similar conclusion can be drawn from the disparity of the number of species listed by T. S. Dias (1966) for Moçambique and the records at present available for L, as well as those between Angola and northern South West Africa. Nevertheless, I am convinced the picture will not materially alter and that the drier, undifferentiated areas will never approach the areas mentioned in *a* for abundance of tabanid species.

c. Regions of higher rainfall have the highest species densities, a conclusion also reached by Goodier (1966). As many known tabanid larvae are semi-aquatic or aquatic, this is logical enough. These areas do not, however, have the highest incidence of endemism. E and D have the highest and most regular rainfall in South Africa, and have respectively 38% and 27% of the South African species. A and M also have regular, orographic rainfall though A is exceptional with rain throughout the year. A has 25% and M 24% of the species. Because the areas have species in common, the total of all the percentages in Table 20 is not 100%.

d. Mountainous regions are usually high in species density, (A, D, M), unless they lie within the rain-shadow of other mountains (K, W). This is partly on account of the high, regular orographic rainfall, and partly on account of the varied habitats the former areas provide. Also the flora of E, D, M and A is particularly prolific and diverse.

2 The distribution of endemic species (table 20, figs 4, 5):

a. The ubiquitous *Haematopota ocellata* is known from no less than 10 of the 15 climatic zones, and *Tabanus taeniatus* from seven different zones. These are the only two really

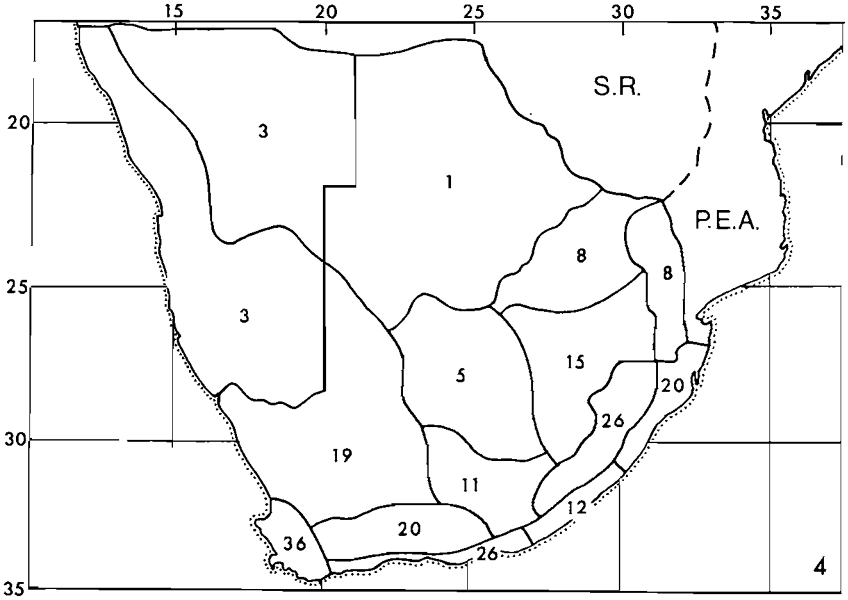

Fig. 4. Map showing the number of species in each region which are endemic to South Africa.

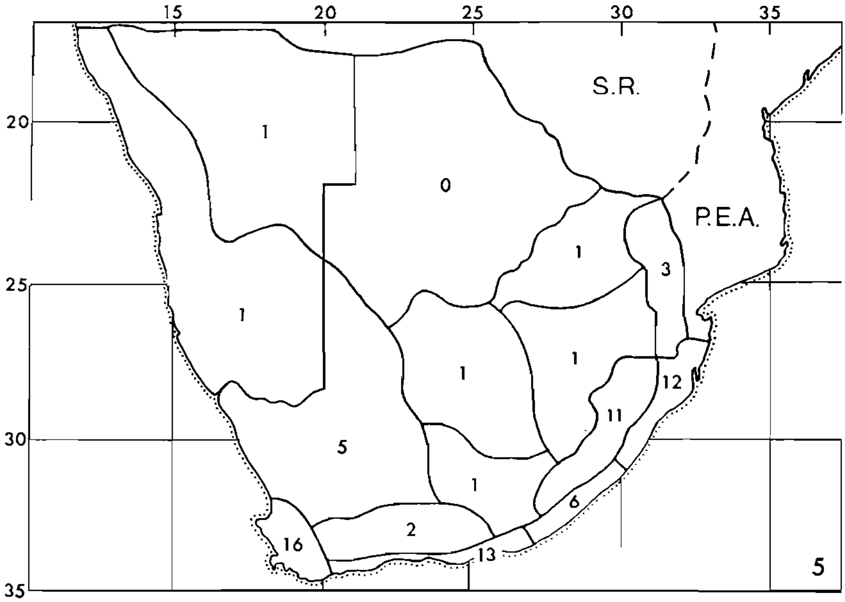

Fig. 5. Map showing the number of species endemic to each region.

widespread endemics, while 74 species (or 60% of all the endemics) are limited to a single region. A summary of regional distribution follows:

1 species has a range of 10 regions
1 species has a range of 7 regions
3 species have a range of 5 regions
10 species have a range of 4 regions
15 species have a range of 3 regions
12 species have a range of 2 regions
74 species are limited to 1 region

b. In the northern and eastern tropical and lowland areas the percentages of the regional totals which are endemic are lowest: SWAn (33%), B (13%), NT (31%), L (31%), E (31%). These areas have inclusions of both flora and fauna from the tropics. In the south the percentages of endemics are the highest: M (90%), K (87%), W (79%), SS (79%). These are the areas of broken topography (and often aridity as well), a factor which favours isolation.

c. The percentage of endemic species per region increases markedly around the east coast from north to south: E (31%), SE (46%), A (62%), M (90%). In the interior from the Limpopo lowveld southwards over the high central plateau there is a similar increase: NT (38%), H (65%), SN (63%), SS (79%).

d. Regions E, SE, A and M are notable for the high proportion of endemic species confined to each of them: (M16), A (13), E (12) and D (11). Two main groups of regions with a high incidence of endemism are A-M-W, and E-D-SE.

3. The distribution of non-endemic species (table 20):

a. This is almost the opposite of the endemic species: here about 34% of the species are known from a single region, whereas 60% of the endemics are so limited. Non-endemic species tend to be more widely spread in South Africa. Also, non-endemic species known from a single region are often tropical inclusions which are widespread beyond the borders of the territory.

1 species has a range of 8 regions
2 species have a range of 7 regions
5 species have a range of 6 regions
5 species have a range of 5 regions
3 species have a range of 4 regions
8 species have a range of 3 regions
8 species have a range of 2 regions
8 species are known from 1 region

b. The regions with the greatest proportion of non-endemics are those in the northern and eastern lowlands, and these species have tropical associations: B (87%), L (65%), NT (65%), E (67%), SWAn (67%). These percentages may well increase when the tabanid fauna is better known here, as more Rhodesian species can be expected in NT and B, Moçambique species in L, and Angolan species north of Etosha in SWAn.

c. Logically, non-endemic species diminish in numbers southwards down the eastern 'tropical corridor': E (67%), SE (50%), A (38%), M (12%).

d. The proportion of non-endemic species diminishes with rising altitudes, L (65%) to H (35%), as well as E (67%) to D (40%).

4. The following is a comparison of the known Tabanid fauna, mainly at the generic level, from three very different regions:

a. K, has only two non-endemic species, *Philoliche* (*P.*) *aethiopica* and *Tabanus leucostomus*. The latter has an amazing ecological tolerance; it is recorded from a dry desert area in the vicinity of a waterhole as well as in well-watered woodland. Consequently, 20 of the 22 species of this region are South African endemics (87%) but of these only two (10%) are endemic to the region [*Mesomyia* (*Perisilvius*) *barnardi* and *Philoliche* (*Phara*) *tumidifacies*]. The remaining endemics are 11 *Philoliche* spp., three *Mesomyia* spp., two *Limata* spp., *Erodiorhynchus edentula*, and lastly *Haematopota ocellata* which is found also in M and E.

b. M, a purely winter-rainfall area, has 90% of its species South African endemics, and of these 44% occur in M alone. The endemics are 14 *Philoliche* spp., one *Stuckenbergina* sp., two *Erodiorhynchus* spp., one *Atylotus* sp., six *Tabanus* spp., three *Haematopota* spp., three *Amanella* spp., three *Limata* spp. *Chrysops* and Rhinomyzini are quite absent. This is truly a remarkable area floristically, faunistically and topographically, being the stronghold of the macchia and associated fauna.

c. The southern tropical savannah reaches E, with the consequent inclusion of tropical flora and fauna. Although E and M are partly coastal and have a maritime climate, the former has summer rainfall and a very different tabanid population, both in the greater variety of representative as well as the larger number of known species. Only 31% of the species in E are South African endemics, and of these 57% are endemic to the region. Five species are shared by M and E; the non-endemics *Philoliche* (*Phara*) *rubramarginata*, *Tabanus leucostomus*, and *T. chevalieri*, and the endemics *Haematopota ocellata* and *H. bipunctata*. All are widespread species with a large ecological tolerance. Also in E are seven *Philoliche* spp., four *Chrysops* spp., two *Hinea* spp., two *Sphecodemyia* spp., three *Tabanocella* spp., eight *Mesomyia* spp., two *Adersia* spp., one *Braunsiomyia* sp., one *Limata* sp., two *Amanella* spp., one *Ancala* sp., one *Euancala* sp., two *Atylotus* spp., 17 *Tabanus* spp. and 11 *Haematopota* spp.

5. *a*. There are few regions with a conspicuous number of endemic species in common. At the tip of the continent M, W and K share species: M (36) and W (19) have 11 in common; M (36) and K (20) have 12 in common; K (20) and W (19) have 12 in common. These are often species which spread from M into adjacent areas of K and W which have permanent water and predictable rainfall. For example, mountain ranges continuous with those of M run into both K and W, and, being high, some of these receive more rainfall regularly than do their surroundings, so providing suitable habitats continuous with those of M. Similarly, mountain passes cut by streams provide suitable environments for a faunistic and floristic extension from M. A (26) and K (20) have 8 species in common, presumably for the same reasons. The lack of predictable orographic rain and the great diurnal temperature range

would discourage a greater infiltration of species into K. In the north H (15) shares 5 species with NT (9), NT (9) shares 3 with L (9) and H (15) shares 6 with SS (11). These areas are largely undifferentiated, rolling savannah, although both H and L have mountainous zones which are known for endemic species. Unfortunately the northern zones are not as well collected as the southern ones.

b. Still considering endemic species only, interesting discontinuities occur in the following zones. Between SE (13) and A (26) there are only 3 species in common. This is due to the Algoa Bay gap, where the karoo reaches down to the sea in the vicinity of the Sundays River valley (Stuckenberg, 1962). A (26) and M (36) share 9 species only: M is a winter-rainfall area with predominantly macchia vegetation, whereas A has rain throughout the year, and also has extensive areas of forest. K (20) and SS (11) have only 3 shared species; SS is a less extreme area than K and more varied topographically and biologically. A (26) and SS (11) have only 4 species in common, which may be due to a coastal to inland savannah difference. H (15) and D (27) have only 6 species in common, that is, a large proportion of the species from H are known in D, but only a small proportion of the large endemic tabanid fauna of D is found in H. This is probably because D has a high rainfall and diversity of habitats compared with the higher, drier and topographically more monotonous H. That SE (13) and E (22) have only 3 species in common is perhaps rather surprising, but may be due to the absence of a true coastal plain in the former contrasting with the extensive Zululand plain. H (15) has only 2 species in common with L (9), but the lowveld and highveld are climatically, faunistically and floristically very different.

6. The distribution of the tribes (table 21):

a. Chrysopsini and Rhinomyzini are absent from M, W and K, as well as from SWAs, SS and SN, that is from areas with little or no forest. E has the greatest number of species of both tribes, and Chrysopsini is almost as well known in A as in E. Probably more representative of both will be recorded from L.

b. Diachlorini is absent from SWAn, SS, SN, H, NT and B, but is numerous in M and A, and also well represented in D. The lack of temperate montane conditions as well as forest may explain these absences, but H could be a collecting gap.

c. Tabanini (fig. 7) is well represented in E and D as well as NT. There is a decline southwards down the east coast, E (21), SE (9), A (8), M (7); also a drop from H (7) to SN and SS which have 3 each. Endemic species are absent from areas with tropical inclusions, namely SWAs, E and L, and most numerous in montane areas D, H and M.

d. Haematopotini is best represented in E, D and H, that is, in subtropical mountainous regions with good rainfall. L, NT and B are probably poorly collected. The *H. ocellata* complex is very widespread and endemic.

e. Bouvieromyini are present throughout, but rare in SWAn, SWAs, SN, SE, H, L, NT and B. Centres of speciation appear to be M + W + A, and E + D. Perhaps topography is the important factor.

f. Philolichini (fig. 6) representatives are rare in the dry western and central regions, SWAs (2), SWAn (1), SS (1), SN (1). They are most numerous at the tip of the continent

TABLE 21—Regional representation and endemism of tribes of Tabanidae

SUBFAMILY TRIBE		M	W	K	A	SWAn	SWAs	SS	SN	SE	E	D	H	L	NT	B
Pangoniinae																
Pangoniini	T	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0
	E	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0
Philolichini	T	14	12	12	13	1	2	5	1	5	7	9	4	5	7	1
	E	13	10	10	12	1	2	4	1	4	4	7	3	4	4	0
Scepsidinae	T	0	1	—	4	—	0	—	—	2	3	—	—	—	—	—
	E	0	0	—	1	—	0	—	—	0	0	—	—	—	—	—
Chrysopsinae																
Chrysopsini	T	0	0	0	3	0	0	1	1	2	4	2	1	1	2	0
	E	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0
Rhinomyzini	T	0	0	0	1	1	0	0	0	2	7	3	1	4	0	1
	E	0	0	0	1	1	0	0	0	1	2	2	0	1	0	0
Bouvieromyiini	T	9	5	4	2	1	1	2	1	1	8	2	1	1	1	1
	E	9	5	4	2	0	0	2	0	1	6	2	1	1	0	0
Tabaninae																
Diachlorini	T	6	2	2	7	0	1	0	0	1	3	4	0	2	0	0
	E	6	2	2	6	0	1	0	0	1	2	4	0	2	0	0
Tabanini	T	7	3	4	8	4	2	3	3	9	21	15	7	9	12	3
	E	4	1	3	2	1	0	2	3	2	0	5	4	0	2	1
Haematopotini	T	3	1	1	3	2	1	3	2	4	11	10	9	4	4	2
	E	3	1	1	2	0	1	3	1	2	5	6	7	2	2	0

T = Total number of species.
E = Number of South African endemics.

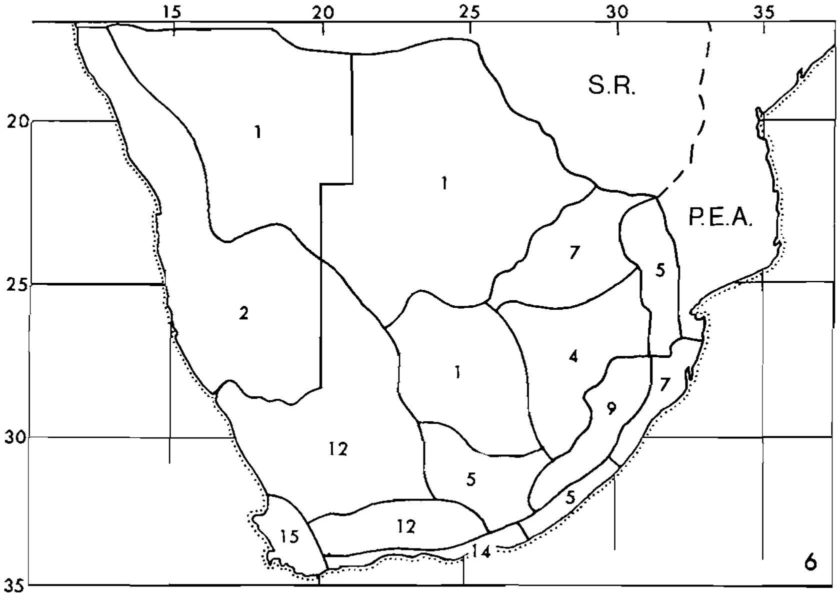

Fig. 6. Map showing the number of species of Pangoniinae known in each region.

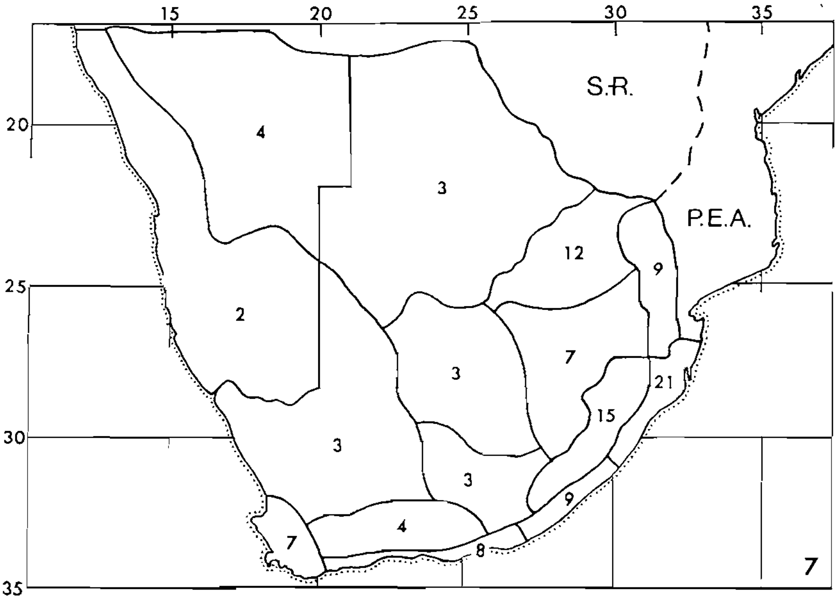

Fig. 7. Map showing number of species of Tabanini known in each region.

and the surrounding zones M (14), W (12), K (12), A (13). All other regions have some species, D with 9 having the most.

g. Pangoniini (fig. 6) is known only from M (1) and A (1).

7. There is some mimicry in the South African Tabanidae, especially among the Philolichini and Rhinomyzini. Apparent bee-mimics are largely open-country species, and the wasp-mimics (*Hinea pertusa* is especially noteworthy) are usually forest or woodland species. Otherwise the family Tabanidae is morphologically uneventful in this area.

8. No immature stages of endemic species have yet been found and those of the major genus *Philoliche* are wholly unknown.

9. Although there are few endemic genera in South Africa, there are many endemic species, the greatest proportion of which are in the Bouvieromyiini (95%), Diachlorini (92%) and Pangoniinae (90%). Surprisingly, Haematopotini, which definitely shows most speciation in the tropical and equatorial zones of the Ethiopian Region, has 72% of its species endemic in South Africa. In Rhodesia, Goodier (1966: 237) found 'the high mountain scrub communities unfavourable for Tabanidae, where vegetation is dominated by Cape species'. This is exactly the habitat in which a large number of South African endemics have been found, particularly in M. Rhodesia is a much smaller area than South Africa, and it has largely political instead of zoogeographical boundaries, but nevertheless it is interesting to note that to date of 90 species recorded from the former, two only are endemic (less than 2%), while 70% of South African species are endemic.

10. The study of South African Tabanidae is far from complete; flight periods, life histories, and host preferences, as well as relationships within the fauna at all levels, remain to be elucidated. The very rarity of records of montane endemic species leads to the belief that humans must be undesirable hosts; game animals are now scarce and the areas unsuitable for cattle, so what does provide their sustenance? I do hope this preliminary study will encourage someone to discover the answers.

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